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PROCEEDINGS

OF THE

TWENTY-NINTH ANNUAL CONVENTION
OF THE

Association of American Agricultural Colleges and Experiment Stations

AND OF THE

FOURTH ANNUAL CONVENTION

OF THE

Land-Grant College Engineering Association

HELD AT

BERKELEY, CALIFORNIA, AUGUST 11-13, 1915

Edited by J. L. HILLS, Secretary
For the Executive Committee of the Association of American Agricultural Colleges and Experiment Stations

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Station; K. L. Hatch, *Assistant Director Agricultural Extension Service*, F. E. Turneaure, *Dean College of Engineering*.

WYOMING—UNIVERSITY OF WYOMING, *Laramie*. C. A. Duniway, *President*; H. G. Knight, *Dean College of Agriculture, Director Experiment Station*; A. E. Bowman, *Director Extension Work in Agriculture and Home Economics;* E. G. Hoefer, *Chairman, College of Engineering*.

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LIST OF DELEGATES AND VISITORS IN ATTENDANCE

ARIZONA: R. H. Forbes, delegate; R. B. von Klein Smid, S. F. Morse, visitors.

ARKANSAS: J. C. Futrall, W. N. Gladson, M. Nelson, delegates.

CALIFORNIA: B. I. Wheeler, T. F. Hunt, W. T. Clarke, M. E. Jaffa, W. G. Hummell, C. Derleth, Jr., delegates; G. H. Allen, E. O. Amundsen, L. D. Batchelor, H. T. Baade, L. F. Boyle, V. C. Bryant, A. H Christiansen, C. M. Conner, C. L. Cory, Mrs. C. M. Conner, A. L. Clarke, Miss L. D. Clarke, J. E. Coit, Miss M. Clark, J L. Condit, B. H. Crocheron, L. M. Davis, Mrs. M. V. Davenport, P. I. Daugherty, W. F. Gericke, S. T. Harding, R. M. Hazen, F. M. Hayes, G. W. Hendry, W. H. Heileman, P. L. Hibbard, D. R. Hoagland, W. L. Howard, R. R. Ingels, M. A. Klein, R. R. Lockhart, F. T. Lyons, R. R. Mack, T. C. Mayhew, B. A. Madson, R. F. Miller, J. W. Mills, D. N. Morgan, F. E. Older, W. E. Packard, W. B. Parks, I. P. Roberts, C. W. Rubel, K. A. Ryerson, N. P. Searls, C. F. Shaw, G. R. Stewart, A. V. Stubenrauch, R. H. Taylor, J. V. Thompson, J. D. Towar, G. H. True, W. P. Tufts, H. E. VanNorman, E. C. Voorhies, J. A. Wann, H. A. Weinland, C. J. Williams, G. H. Wilson, F. W. Woll, visitors.

COLORADO: C. A. Lory, S. A. Johnson, C. P. Gillette, W. P. Headden, H. T. French, E. B. House, delegates; M. N. Dillon, C. L. Hover, Mrs. C. A. Lory, W. H. Lauck, W. H. Olin, visitors.

FLORIDA: P. H. Rolfs, delegate.

DELAWARE: H. Hayward, delegate.

GEORGIA: R. J. H. DeLoach, delegate; J. S. Carroll, visitor.

HAWAII: W. R. Farrington, delegate; Miss M. E. Chipman, J. E. Higgins, visitors.

IDAHO: M. A. Brannon, J. S. Jones, O. D. Center, H. W. Hochbaum, delegates.

ILLINOIS: J. C. Blair, A. W. Jamison, delegates.

INDIANA: G. I. Christie, delegate; W. O. Fitch, visitor.

IOWA: R. A. Pearson, C. F. Curtiss, R. K. Bliss, A. Marston, delegates; Mrs. A. Marston, Miss C. J. Mackay, Mrs. R. A. Pearson, C. S. Nichols, Mrs. R. K. Bliss, visitors.

KANSAS: H. J. Waters, W. M. Jardine, J. T. Willard, A. A. Potter, E. C. Johnson, delegates.

KENTUCKY: Miss M. E. Sweeney, visitor.

LOUISIANA: W. R. Dodson, delegate; F. R. Phillips, F. W. Zerban, visitors.

MAINE: R. J. Aley, C. D. Woods, delegates.

MASSACHUSETTS: W. P. Brooks, W. D. Hurd, H. W. Tyler, delegates; Mrs. W. D. Hurd, visitor.

MICHIGAN: J. L. Snyder, R. S. Shaw, R. J. Baldwin, G. W. Bissell, delegates; Mrs. R. J. Baldwin, Mrs. L. L. Peppard, Mrs. J. L. Snyder, L. R. Taft, visitors.

MINNESOTA: A. V. Storm, R. W. Thatcher, delegates; Miss J. T. Berry, visitor.

MISSISSIPPI: J. R. Ricks, delegate.

MISSOURI: A. R. Hill, F. B. Mumford, A. J. Meyer, E. B. Hedrick, delegates; J. Moyes, Mrs. F. B. Mumford, Miss L. Stanley, W. P. Kotchetkow, visitors.

MONTANA: J. M. Hamilton, F. B. Linfield, F. S. Cooley, A. W. Richter, R. A. Cooley, delegates; E. S. Currier, visitor.

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NEBRASKA: S. Avery, E. A. Burnett, C. W. Pugsley, O. V. P. Stout, delegates; Miss H. Peterson, Mrs. S. Avery, Miss A. M. Loomis, G. W. Hood, H. P. Boardman, visitors.

NEVADA: J. G. Scrugham, S. B. Doten, C. A. Norcross, delegates.

NEW HAMPSHIRE: J. C. Kendall, C. E. Hewitt, delegates; Mrs. J. C. Kendall, visitor.

NEW MEXICO: F. Garcia, delegate; Mrs. F. Garcia, A. C. Cooley, Mrs. A. C. Cooley, R. F. Hare, R. L. Stewart, visitors.

NEW JERSEY: J. G. Lipman, A. A. Titsworth, delegates.

NEW YORK: C. L. Crandall, delegate; F. E. Geldenhuys, visitor.

NORTH CAROLINA: D. H. Hill, B. W. Kilgore, delegates; Mrs. D. H. Hill, T. F. Parker, visitors.

NORTH DAKOTA: J. H. Worst, T. Cooper, delegates; Mrs. J. H. Worst, Miss M. A. Stoner, visitors.

OHIO: C. E. Thorne, E. F. Coddington, A. Vivian, delegates; Mrs. C. E. Thorne, visitor.

OREGON: W. J. Kerr, A. B. Cordley, R. D. Hetzel, G. A. Covell, delegates; A. E. Lovett, Miss A. B. Milham, H. Cowgill, F. L. Griffin, Miss S. L. Lewis, G. R. Hyslop, visitors.

OKLAHOMA: J. W. Cantwell, W. L. Carlyle, delegates; Miss E. Allen, visitor.

PENNSYLVANIA: E. E. Sparks, R. L. Watts, M. S. McDowell, delegates; Miss A. M. East, Mrs. M. S. McDowell, visitors.

RHODE ISLAND: H. Edwards, B. L. Hartwell, A. E. Stene, delegates; Mrs. A. E. Stene, Miss M. E. Edwards, visitors.

SOUTH CAROLINA: W. M. Riggs, J. N. Harper, delegates; Mrs. W. M. Riggs, Mrs. J. N. Harper, Miss L. E. Harper, W. A. Mace, visitors.

SOUTH DAKOTA: G. L. Brown, J. W. Wilson, G. D. Randlett, delegates; E. K. Eyerly, visitor.

TENNESSEE: H. D. Tate, delegate.

TEXAS: W. B. Bizzell, B. Youngblood, C. Ousley, D. W Spence, J. M. Jones, A. T. Potts, delegates; F. W. Davis, visitor.

UTAH: J. A. Widtsoe, E. D. Ball, E. G. Peterson, J. F. Caine 3rd, delegates; C. W. Porter, Miss G. M. McCheyne, visitors.

VERMONT: J. L. Hills, T. Bradlee, R. T. Burdick, delegates.

VIRGINIA: C. K. Graham, delegate; Mrs. C. K. Graham, visitor.

WASHINGTON: E. A. Bryan, I. D. Cardiff, J. A. Tormey, F. A. Thomson, delegates; Miss M. F Rausch, Miss M. E. Sutherland, A. W. Taylor, Miss A. H. Craig, A. B. Nystrom, G. Severance, T. J. Newbill, Mrs. V. K. Hayward, visitors.

WEST VIRGINIA: C. R. Titlow, C. R. Jones, delegates; Mrs. C. R. Jones, visitor.

WISCONSIN: H. L. Russell, K. L. Hatch, F. E. Turneaure, delegates; Miss G. Russell, E. B. Russell, visitors.

WYOMING: C. A. Duniway, A. E. Bowman, E. G. Hoefer, J. A. Hill, delegates.

UNITED STATES DEPARTMENT OF AGRICULTURE: A. C. True, delegate; O. H. Benson, G. A. Billings, D. A. Brodie, L. A. Clinton, Miss M. E. Creswell, R. H. Goddard, B. Knapp, C. H. Lane, M. H. Laplam, B. H. Rawl, C. B. Smith, D. W. Working, visitors.

OFFICE OF EXPERIMENT STATIONS: E. W. Allen, delegate.

UNITED STATES BUREAU OF EDUCATION: S. P. Capen, delegate; Mrs. H. W. Calvin, visitor.

CANADA, BRITISH COLUMBIA: L. S. Klinck, visitor.

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CONSTITUTION

NAME

This association shall be called the Association of American Agricultural Colleges and Experiment Stations.

OBJECT

The object of this association shall be the consideration and discussion of all questions pertaining to the successful progress and administration of the colleges and stations included in the association, and to secure to that end mutual cooperation.

MEMBERSHIP

(1) Every college established under the act of Congress approved July 2, 1862, or receiving the benefits of the act of Congress approved August 30, 1890, and every agricultural experiment station established under state or congressional authority, the Bureau of Education of the Department of the Interior, the Department of Agriculture, and the Office of Experiment Stations of the last named Department shall be eligible to membership in this association.

(2) Any institution a member of the association in full standing may send any number of delegates to the meetings of the association. The same delegate may represent both a college and a station, but shall vote in only one section, and shall cast only one vote in general sessions. Other delegates may be designated by an institution to represent it in specified divisions of the sections of the association, but such delegates shall vote only in such divisions and no institution shall be allowed more than one vote in any sectional meeting.

(3) Delegates from other institutions engaged in educational or experimental work in the interest of agriculture or mechanic arts may, by a majority vote, be admitted to conventions of the association with all privileges except the right to vote.

(4) In like manner, any person engaged or directly interested in agriculture or mechanic arts who shall attend any convention of this association may be admitted to similar privileges.

SECTIONS

(1) The association shall be divided into three sections: (*a*) a section on college work and administration, (*b*) a section on experiment station work, (*c*) a section on extension work, composed of directors or superintendents of extension departments in the institutions in this association, or the representatives of such departments duly and specifically accredited to this section.

The section on college work and administration shall be composed of the presidents or acting presidents of colleges and universities represented in the association, or other representatives, of such institutions duly and specifically accredited to this section, and no action on public and administrative questions shall be final without the assent of this section.

The section on experiment station work shall be composed of the directors or acting directors of experiment stations represented in the association, or of other representatives of such stations duly and specifically accredited to this section.

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(2) Members of these three sections (and no others) shall be entitled to vote both in general sessions and in the section to which they respectively belong.

The representative appointed by the United States Bureau of Education shall be assigned to the section on college work and administration; the representative of the Office of Experiment Station to the section on experiment station work; and the representative of the United States Department of Agriculture to either section as he may elect and the section by vote authorize; but such election once made and authorized may not be changed during the sessions of a given convention.

Each section may create such divisions as it may from time to time find desirable, and shall elect its own chairman and secretary for sectional meetings, whose names shall be reported to the association for record.

(3) Each section shall conduct its own proceedings, and shall keep a record of the same, and no action of a section, by resolution or otherwise, shall be valid until the same shall have been ratified by the association in general session, and in the case provided for in the foregoing paragraph (1) shall also have been approved by the section on college work and administration.

MEETINGS

(1) This association shall hold at least one meeting in every calendar year, to be designated as the annual convention of the association. Special meetings may be held at other times, upon the call of the executive committee, for purposes to be specified in the call.

(2) The annual convention of the association shall comprise general sessions and meetings of the sections, and provision shall be made therefor in the program. Unless otherwise determined by vote, the association will meet in general session in the forenoons and evenings of the convention and the sections in the afternoons.

OFFICERS

(1) The general officers of this association, to be chosen annually, shall be a president, five vice-presidents, a bibliographer, and a secretary, who shall also be treasurer, and an executive committee of five members, three of whom shall be chosen by the section on college work and administration and two by the section on experiment station work; *provided*, however, that a member chosen by either section need not be a member of that section. The executive committee shall choose its own chairman.

(2) Each section shall, by ballot, nominate to the association in general session for its action a chairman and a secretary for such section.

(3) The president, vice-presidents, secretary, and bibliographer of this association shall be elected by ballot upon nomination made upon the floor of the convention, and shall hold office from the close of the convention at which they are elected until their successors shall be chosen.

(4) Any person being an accredited delegate to an annual meeting of the association, or an officer of an institution which is a member of the association in full standing at the time of election, shall be eligible to office.

DUTIES OF OFFICERS

(1) The officers of the association shall perform the duties which usually devolve upon their respective offices.

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(2) The president shall deliver an address at the annual convention befor the association in general session.

(3) The executive committee shall determine the time and place of the annual conventions and other meetings of the association, and shall between such conventions and meetings act for the association in all matters of business. It shall issue its call for the annual conventions of the association not less than sixty days before the date on which they are to be held, and for special meetings not less than ten days before such date. It shall be charged with the general arrangements and conduct of all meetings called by it. It shall designate the time and place of the convention. It shall present a well-prepared order of business, of subjects for discussion, and shall provide and arrange for the meetings of the several sections. The subjects provided for consideration by each section at any convention of the association shall concentrate the deliberations of the sections upon not more than two lines of discussion, which lines, as far as possible, shall be related. Not more than one-third of the working time of any annual convention of the association shall be confined to miscellaneous business.

FINANCES

At every annual convention the association in general session shall provide for obtaining the funds necessary for its legitimate expenses and may, by appropriate action, call for contributions upon the several institutions eligible to membership; and no institution shall be entitled to representation or participation in the benefits of the association unless such institution shall have made the designated contribution for the year previous to that in and for which such question of privilege shall rise, or shall have said payment remitted by the unanimous vote of the executive committee.

AMENDMENTS

This constitution may be amended at any regular convention of the association by a two-thirds vote of the delegates present, if the number constitute a quorum; *provided*, that notice of any proposed amendment, together with the full text thereof and the name of the mover, shall have been given at the next preceding annual convention and repeated in the call for the convention. Every such proposition of amendment shall be subject to modification or amendment in the same manner as other propositions, and the final vote on the adoption or rejection shall be taken by yeas and nays of the institutions then and there represented.

RULES OF ORDER

(1) The executive committee shall be charged with the order of business subject to special action of the convention, and this committee may report at any time.

(2) All business or topics proposed for discussion and all resolutions submitted for consideration of the convention shall be read and then referred, without debate, to the executive committee to be assigned positions on the program.

(3) Speakers invited to open discusion shall be entitled to twenty minutes each.

(4) In general discussions the ten-minute rule shall be enforced.

(5) No speaker shall be recognized a second time on any one subject while any delegate who has not spoken desires to do so.

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(6) The hours of meeting and adjournment adopted with the general program shall be closely observed, unless changed by a two-thirds vote of the delegates present.

(7) The presiding officer shall enforce the parliamentary rules usual in such assemblies and not inconsistent with the foregoing.

(8) Vacancies which may arise in the membership of standing committees by death, resignation, or separation from the association of members shall be filled by the committees respectively.

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Proceedings of the Twenty - Ninth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations

MINUTES OF THE GENERAL SESSIONS

MORNING SESSION, WEDNESDAY, AUGUST 11, 1915

The Convention was called to order at 10 A. M. at the Agricultural Hall of the University of California, Berkeley, California, by the president, E. A. Bryan of Pullman, Washington.

Prayer was offered by President E. E. Sparks of Pennsylvania.

THE PRESIDENT. It is a matter of deep regret that we miss the familiar face and form of the chairman of the Executive Committee, President Thompson of Ohio. In his absence, President Waters of Kansas will act as chairman.

We are honored and privileged to hold this convention as the guests of the University of California whose president, Benjamin Ide Wheeler, will now welcome us.

B. I. WHEELER. Friends, I am glad to see you here in this land of freshness and freedom and oportunity. The last time I had the pleasure of speaking before this body we were assembled in solemn encampment before the gates of appropriation at Washington; and today it is removed far away from Washington, the Department of Agriculture and the Federal Treasury. When you come so far away you gain perspective and a sense of the proportion of things. Some of the little yearnings which disquieted your souls in Washington are removed today in the face of this sunshine and elbow room. There always have been appropriations enough in California. When we have been here a while we need only sunshine and air. We get out of the notion of measuring things by sordid values. We started out here as a gold seeking enterprise and gradually are becoming an agricultural enterprise and are interested in sociological problems and particularly with getting the land into the hands of the families.

This is a peculiar land and a peculiar people; a distinct province within the Nation, with which one must get acquainted in order to meet its needs. It is a great broad stretching land with problems. The College of Agriculture is busied chiefly with settling some of those leading problems which are urgent here, some of which after a while will spread across the continent.

As I just stated, our business ultimately is a sociological business. Considerations of soil technology but scratch the surface. What we are busied with here is trying to find out how to adjust this soil to the use of the families. We have been worried a good deal because many shrewd and sharp people have wanted to discount the future in the matter of the price of land; because land values have increased here suddenly to such an extent that it is practically impossible for families to live on the land. We must give the people more information as to land values, information heretofore given mostly by

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corporations interested in making money out of the situation. We have got to deal with the people honestly and openly.

These Californians are frank and breezy people. They will tell you things as they are and horrify you by their frankness. You have got to deal with situations here as open and above board. Our newspapers stand for openness of speech. We like to know what is going on and our newspapers, corresponding very closely to our demands, tell us. They are as peculiar as are the other things. But whatever we are, we are trying to do the work that we think is laid upon us to do.

This agricultural college has gone its own way, but insists on doing the work it does thoroughly and well. Californians tolerate no fakerism. The name of "Hilgard", whatever else it may stand for, is a sure preventive of fakerism. We are trying now, honestly and earnestly, under splendid leadership, to create something that will be worth while. Our regents are making every sacrifice in the management of our budget for the promotion of this institution.

We had to solve a difficult problem for ourselves, situated here in an urban community, which is no place to enter upon the actual processes of agriculture. Therefore we have our university farm at Davis, a hundred miles from here. We were told that it was impossible thus to solve the problem, that it could not be done; but it is being done and we are solving that problem, a form of solution which will be good for you to know. There is no longer any voice raised in favor of separatism, of a separate agricultural school. Our farmers want agriculture established in all its fullness right here at the State University. They would no more think today of eliminating agriculture from the university curriculum because it is in an urban location than they would think of removing the School of Mines to some place like Dutch Flat simply because that is and this is not a mining community.

The University of California opens its doors and stretches out its hands. Enter and make yourselves at home.

After the call of the roll of the delegates, the report of the Executive Committee was presented by the acting chairman, H. J. Waters of Kansas.

Report of the Executive Committee

The Executive Committee submits the following report for your information and consideration:

1. One important topic that has been before the Executive Committee for the year has been the operation of the Smith-Lever Agricultural Extension Act. All members of the Association recognize that during the initial year of this Act a large number of local problems would naturally arise. The fact is obvious also that in the general administration of the provisions of the Act questions naturally arise as to its operation.

In the first place intimations have been made to the Executive Committee that in certain cases federal departmental officials have dealt in official and administrative matters directly with county agents and managers of boys' and girls' clubs rather than through the extension director. This practice was presumed to be out of harmony with the memorandum of understanding presented at the Washington meeting. On June 29 and 30, the Executive Committee held a joint session with the States Relations Committee at Washington, D. C., at which time this matter was discussed and a number of other details developed. It appears that where departmental officials have dealt directly with subordinate state officers without the knowledge

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and consent of the state extension directors and leaders, it has been done without the knowledge or approval of the Department. The Department has now completed the organization of its coordinating machinery for the administration of this work by the creation of the States Relations Service. It is the purpose of the Department to take such action as will remove the friction which might arise from failure to give proper recognition to state officers in charge of extension work. The attitude of the Honorable Secretary of Agriculture was perfectly frank and straightforward, with full recognition of the difficulties surrounding the administration of extension work and with a very clear determination to join in an effort to remove as far as possible all causes for friction. The Executive Committee therefore suggests to the Association that the causes of complaint, and perhaps even the dissatisfaction, found to exist here and there in all probability will be removed very promptly. Its opinion, however, is that it will be well for the Association to acquaint itself with the practical workings of the Smith-Lever Act and to provide for such exchange of views as would be profitable. It is highly important that the Executive Committee for the coming year should have information from the colleges in order that this information might be used as a basis of discussion with the Department of Agriculture in adjusting whatever difficulties may develop. It is suggested therefore, rather urgently, that the officials of the colleges, and especially those interested in the extension work, communicate to the Executive Committee information upon this matter and thus aid in the solution of whatever problems may arise. No one is more cognizant of the difficulty and often delicacy of dealing with this great and fundamental activity than the officials of the Department of Agriculture. Already the magnitude and the diversity of the work are impressing themselves upon the administrative officers. The one great issue will be to develop unity and sufficient diversity to meet the local needs while making effective the fundamental principles of the law. Therefore, in the first stage of our enthusiasm we must not overlook the fact that we are laying foundations for a generation of nation-wide activity, appealing strongly to the popular sentiment, but at the same time laying upon the several institutions and the Department of Agriculture a responsibility for which the legislative bodies of the country are liable to hold us to a rather strict account.

2. The Executive Committee at its June meeting also discussed with the Secretary the general subject of the coordination of the research work of the Department with that of the state experiment stations. It appeared that at present the Department has no adequate administrative machinery for dealing with this problem; but the Secretary assured the committee that he would undertake to make such definite provision. In the judgment of the committee the States Relations Service should be definitely charged with this business.

3. The Executive Committee, merely by way of suggestion, would call attention to the fact that one of the most difficult problems in the administration of the Smith-Lever Act will be the adjustment of salaries. The enormous demand for extension workers will tend to put the salaries of such persons at a higher rate than the salaries paid in the colleges of agriculture. The result will be that less experienced men will be receiving higher pay than will more experienced men, that many will be tempted to leave teaching and research work in order to engage in extension work. It is well for the administrative officers to recognize the fundamental importance of the teaching and research work of the colleges and the difficulty existing

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in many states of any rapid increase in the amount of money available for general salaries. On the other hand, by the very terms of the Smith-Lever Act, and almost by automatic action, a considerable amount of money will be available for extension work. A distinct tendency already is recognized for states to bid against each other and for counties, in the employment of county agents, to do the same thing. Of course no disposition is manifested on the part of interested men to discourage a movement for better salaries, but the committee suggests that there ought to be a certain balance as between the two great lines of effort, teaching in the colleges and teaching in the extension division. This principle applies with equal force also to men engaged in the experiment stations. We can hardly expect that the love and loyalty of man to peculiar phases of the work will be sufficient to guarantee against this danger. The committee suggests that in the development of extension work, college authorities recognize the importance of a similar progress in the development of the funds available for use in lines other than extension. If any great disparity is allowed to develop, the inevitable tendency will be to minimize in the minds of legislators the importance of the work at the institution and to overemphasize the importance of the state-wide service. We who are engaged in all these activities should regard ourselves as responsible for keeping them in their proper relations to each other and for inculcating the proper attitude of the public mind on these three great and fundamental activities.

4. The Executive Committee would report that during the year important meetings have been held and reports will be submitted to this Convention by the Committee on Extension Organization and Policy and by the Committee on College Organization and Policy.

5. The Executive Committee would call attention to the meeting of the Second Pan-American Scientific Congress to be held in Washington, December 25, 1915, to January 8, 1916. There are nine important sections provided for in the organization. It has been suggested that this Association send delegates to this Congress. The organization provides for three classes of members: first, the official delegates of the countries represented; second, the representatives of the universities, institutes, societies, and scientific bodies of the countries represented; third, such persons in the countries participating in the Congress as may be invited by its executive committee, with the approval of the countries represented.

This Association has not been in the habit of sending official delegates to such meetings. The Executive Committee therefore offers no recommendation in the matter, although many members of the Association will doubtless desire to attend the meetings of the Congress.

6. The Executive Committee reports touching the proposed constitutional amendments (27th Proceedings, page 105, 28th Proceedings, pages 138-151), as follows:

At the last meeting of this Association the following action was taken:

"Moved, that the Executive Committee be requested to poll the membership of the Association on the question: What changes would you suggest in the Constitution and methods of organization of this Association; and further, that the committee after this canvass is completed, report its own conclusions upon the question and make such recommendations of changes in the Constitution of the Association, or such other steps, as it may regard as necessary or desirable in order to carry out its conclusions." (28th Proceedings, page 150.)

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Pursuant to this action the Executive Committee addressed a letter under date of May 22, 1915 to the several colleges and stations, calling attention to the several motions and discussions as reported in the Proceedings and to the action taken. Separate printed copies of the Constitution were forwarded with the letter and request made for replies in order that the Executive Committee might have the data desired for a report.

Exclusive of those represented by members of the Executive Committee, sixteen institutions responded. From one institution three men wrote expressing three different points of view. Four presidents responded. Twelve deans or directors and three extension officers responded. Obviously less than half the institutions replied. There was no such general response on the part of the officers as would intimate to the Executive Committee any preponderating sentiment one way or the other. At most one-half of the votes could be counted as favoring in a general way the amendment proposed; about one-third were opposed; and some responses made new proposals without committing the authors definitely to any program. In general it may be said that the method proposed by the resolution above cited brought to the Executive Committee very little information or guidance. After correspondence and some discussion at a meeting held in Washington, June 30, it was agreed that the chairman of the Committee should prepare a report and print it for distribution at the coming convention.

This report therefore is submitted with a definite understanding that the chairman alone is to be held responsible for its contents since it was impracticable to submit it for amendment and approval to the several members.

It seems advisable at the outset of the discussion of this matter to present a review of such past action taken by this Association as seems pertinent.

The Honorable Norman J. Colman, Commissioner of Agriculture, under date of May 6, 1885, issued a call for the first convention which assembled in Washington, July 8, 1885. At this convention there were present representatives of the Federal Department of Agriculture, boards of agriculture, the agricultural press, persons representing agriculture in foreign countries, the agricultural colleges, the experiment stations and individual delegates representing agricultural interests, in all 78 persons. This convention of delegates made provision for perpetuating the existence of the body not yet organized under a definite plan.

In the Proceedings of the second annual convention of the Association of American Agricultural Colleges and Experiment Stations, held at Knoxville, Tenn., January 1, 2, and 3, 1889, there appears a brief Constitution. In the Proceedings of the third annual convention, held in Washington, November 12-15, 1889, the Constitution appears with an amendment providing for permanent committees. The following sentences are quoted from this instrument: "The Association shall be organized into permanent committees upon the several classes of special subjects, the consideration of which shall become desirable. Provision shall be made in the programme for conferences of each of the committees, either simultaneously or consecutively as the Executive Committee shall determine. There shall be permanent committees on agriculture, on botany, on chemistry, on entomology, and on horticulture; and the Executive Committee, upon request of any five institutions represented in the Association, shall provide for the organization of a new committee at any convention."

In the Proceedings of the fourth annual convention, held at the University of Illinois, November 11-13, 1890, the Constitution appears with the paragraph on permanent committees amended with the title "permanent

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committees" changed to "sections" with appropriate changes in the phraseology, and a section on "college work" is added.

In the Proceedings of the sixth annual convention, held at New Orleans, November 15-19, 1892, the Constitution appears with amendments as follows:

"1. The Association shall be organized into sections upon (1) College work; (2) Agriculture and Chemistry; (3) Horticulture and Botany; (4) Entomology; (5) Mechanic Arts. The Executive Committee shall, upon the request of any ten institutions represented in the Association, provide for the organization of provisional sections at any convention.

2. Each section shall conduct its own proceedings and shall keep record of the same, and present a synopsis thereof to the Association at the close of every convention; and no action of a section, by resolution or otherwise, shall be valid until the same shall have been ratified by the Association in general session."

It would interest members of the Association to read the debate on the amendment introduced by President J. K. Patterson of Kentucky, providing for a section on mechanic arts, inasmuch as a separate association was then under discussion. (See 6th Proceedings, page 74.)

In accordance with the above amendment to the Constitution, the first annual meeting of the section on mechanic arts was held with the Association at Chicago, in October, 1893. In the Proceedings of the Association for the meeting at Denver, Colorado, July 16-18, 1895, page 18, there appears the following report from the section on mechanic arts:

"During the past year an effort has been made to develop practically but one side of the section on mechanic arts, viz., the correlation of mechanic arts and agriculture.

The Society for the Promotion of Engineering Education covers the broader field of engineering, and we believe that our range of work in this Association should be a limited one.

By well directed efforts the section on mechanic arts can be made a valuable adjunct to the agricultural side of this Association by bringing more intimately in contact the agricultural and mechanical work in the colleges.

We believe that some steps should be taken to send at least one delegate from the colleges of the Association to represent the mechanical side of our institutions, but if such a move is to be made the agriculturalists must take the initiative.

Most of our men interested in mechanic arts are indifferent toward doing work for the Association, claiming that the Association is essentially agricultural and it is the intention of the agriculturalists to keep it within such limits."

In the report from the section on mechanic arts presented at the tenth annual convention, Washington, November 10-12, 1896, (see Proceedings, pages 26-28), there appeared this paragraph: "Many of the professors in the mechanical departments have expressed themselves as being very desirous of attending these meetings and exchanging ideas with their fellow workers. Why are they not present the same as the professors from the other college departments? Could not this be brought about? Can not the college presidents and trustees present see to it that more of the mechanical men are present at these meetings?"

The following extract is taken from the Proceedings of the eleventh annual convention, held at Minneapolis, July 13-15, 1897. (See page 28 for full report.)

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"At the tenth annual convention of this Association, held at Washington, D. C., November 1896, a special committee was appointed 'to revise the Constitution of the Association and report at the next annual convention.' The committee thus appointed, having considered the subject assigned, begs leave to submit the following report:

"The members of the committee have discussed the important matter among themselves, and have obtained the opinion of a number of gentlemen heretofore active in the work of the Association whom it has been convenient to consult. A considerable diversity of opinion has been developed as to the most useful form for the Association to take to accomplish its future work, and it seems expedient to present two different propositions.

A majority of the committee and of those whom it has been practicable to confer with, favor a radical change in the Constitution, and this is first submitted for consideration and action.

This plan proposes the abolition of all sections, so that, if adopted, the annual convention of the Association thereafter would be a meeting of the executive officers of colleges and stations, with such other and special delegates as the institutions respectively saw fit to send to these conferences.

It is believed by those favoring this plan that it will bring the Association back effectively to its original purpose, namely, the consideration in annual conference of the problems of college and station administration, as affecting (a) internal working, (b) relations of the Government of the United States, (c) relations to the State Governments respectively, (d) relations to other institutions, and (e) attitude toward new legislation proposed from time to time.

The delegates who are able to assemble annually as representatives of the institutions forming the Association need the entire time at their disposal to enable them to give undivided attention to these subjects of paramount importance.

If the sections are continued, the natural tendency will be to increase the number, because, if it is good policy to have any departments of colleges and stations represented by specialists, it is expedient and right that all departments should have equal opportunities. Following this logical course it will be more difficult than it now is to select and limit the attendance at these conventions.

There are, however, other organizations of chemists, engineers, botanists, etc., which professors and investigators desire to attend at which they have ample opportunities for the work they now seek to do at the conventions of this Association, and where for many reasons it is better for them to go. At these other meetings delegates from the various land-grant colleges and experiment stations come in contact not only with men from institutions of like character, but also with men from all the other colleges and universities and technical schools. This opens a wider field and presents superior advantages. Many believe that, forced on economical grounds to make choice, the institutions concerned and their workers will decide that their time and money can be more profitably used by attendance at these larger and more general gatherings than at the special meetings of this body."

At the twelfth annual convention in Washington, November 15-17, 1898, the proposed amendments were discussed at two sessions and the proposals defeated by a vote of 44 to 8. Members are referred to the Proceedings, pages 46 and 54, for a good summary of the conditions then existing and for an illuminating discussion by experienced members of the Association.

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Before adjournment at San Francisco a "committee on the revision of the Constitution" was appointed. This committee reported at the fourteenth annual convention, held at New Haven, November 13-15, 1900, with but two amendments, one referring to the program and one to membership. The article on membership as proposed read as follows, the italics indicating the amendment: "Every college established under the act of Congress approved July 2, 1862, or receiving the benefits of the act of Congress, approved August 30, 1890, *and every department of mechanic arts so established*, and every agricultural experiment station, etc.

Action on this amendment was taken at the fifteenth annual convention held in Washington, November 12-14, 1901. (See Proceedings, page 50.) This action struck out the proposal to give representation to the department of mechanic arts, evidently on the theory that institutions and not departments should have representation. The section on mechanic arts was continued as before. On pages 38-40 of the Proceedings for 1901 will be found an admirable report on the scope of the work for the section in mechanic arts, made by H. W. Tyler, chairman of the section for that year.

At the sixteenth annual convention, Atlanta, Georgia, October 7-9, 1902, a proposal to amend the Constitution was made. (See Proceedings for 1902, page 44.) The proposed amendments provided for two sections: (1) A section on college work and administration; (2) a section on experiment station work. The amendments proposed provided further that each section might create such divisions as it may from time to time find desirable.

At the seventeenth annual convention, in Washington, November 17-19, 1903, the amendments were adopted by a vote of 53 to 1. From this time on no further mention appears of mechanic arts in the program of the Association. By a series of amendments to the Constitution there disappeared the sections on agriculture and chemistry, on horticulture and botany, on entomology and on mechanic arts. It would appear that the Association had through a series of years with no little debate steadily developed into a convention of administrative officers in which the two great interests were the colleges of agriculture and the experiment stations.

In stating this conclusion as of the date of 1903, it should be noted that repeatedly there was represented to the Association the need of engineering experiment stations and that at one time the Association expressed its preference between two bills, favoring the one for the experiment stations.

At the twenty-second annual convention, held in Washington, November 18-20, 1908, (see Proceedings, page 44), a proposal to amend the Constitution by creating a section on the extension work was announced. In the subsequent year at the Portland meeting of the Association in 1909, the section on extension work was adopted and the Constitution amended to include it.

Subsequently a new Association was organized known as the Land-Grant College Engineering Association. This has now been in active operation for a period of three years and is holding its fourth session during the current week. The question is now raised whether this body should continue as a separate and distinct association, or whether it should be recognized as a division of the parent Association on the same basis as the colleges of agriculture, experiment stations and extension divisions.

It may be worth while to direct the attention of the Association to the fact that the Act of 1862 recognizes the colleges of agriculture and mechanic arts. It does not recognize separate colleges of agriculture or separate colleges of mechanic arts. The division into agricultural and mechanic arts is an administrative convenience as constituted in separate institutions.

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In some of the states, like Michigan and others, these institutions have the subdivisions known as agricultural and mechanic arts, whether called schools or colleges or divisions, being not vital. In other institutions, like Illinois and Ohio, the universities have a number of colleges or schools where agriculture is given a separate administration, as is also mechanic arts, usually under the title of engineering. These colleges are on the same basis as colleges of law, medicine or other administrative devices, but are to be regarded as subdivisions of the institutions, whether known as college or university.

The experiment stations were provided for in the Hatch Act, by a separate Act of Congress, which said: "There shall be established, under direction of the college or colleges or agricultural department of colleges, * * * * a department to be known and designated as an 'agricultural experiment station'." In section eight of the Act, provision was made by which any state might constitute an agricultural experiment station separate from the agricultural college and under separate management. Some states have taken advantage of this provision. This situation has probably given rise to the confusion over the term "institution" (See 28th Proceedings, pp. 138-142), since evidently a separate station would be regarded as an institution, whereas a station, organized as a department of the college of agriculture or mechanic arts, might not be so construed.

In the development of the proposed organization it might be well, therefore, to recognize the fact that the engineering divisions are not separate institutions and that it would be well to cling to the legal term "mechanic arts", since this term has been interpreted by this Association to include all types of engineering. The mere academic question as to the relation between mechanic arts and engineering may be left for leisurely discussion, but it would seem well for the Association to use the legal terms as provided in the Acts of Congress, leaving the interpretation of these terms as a matter of detail.

It may be remarked further that since home economics has been named definitely in the Smith-Lever Act, certain persons are disposed to regard that as a warrant for a section on home economics. It may be suggested, however, that the object of the Smith-Lever Act was to provide for agricultural extension, under which term home economics was but one of the specifications. It is doubtful, therefore, whether a section on home economics could be justified any more than sections on other subjects specifically named in the second Morrill Act.

In giving this subject consideration it may be well to cast a look forward. There is good reason to believe that Congress sooner or later will provide for engineering experiment stations. This Association repeatedly has endorsed the proposal. Some institutions in the country already have established and organized these stations. This is following the precedent by which certain agricultural experiment stations were established prior to the Hatch Act. When such stations are provided for by law we shall know whether they are to be regarded like the agricultural experiment stations as subdivisions of the colleges of agriculture and mechanic arts, or whether they are to be looked upon as separate institutions under a separate form of government. In no case could they be subdivisions of a college of engineering, since these colleges are not legal entities, but administrative subdivisions of colleges or universities, although it will be granted freely that their management would be under the direction of the teachers of mechanic

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arts or engineering just as now the agricultural experiment stations chiefly are under the direction of the men engaged in agriculture.

The Association therefore seems to be confronted with one or two policies.

First. The original idea may be revived of a convention representing the colleges organized under the Act of 1862 with subdivisions known either as committees or sections, including all the activities of these institutions or so many of them as the Association may decide. The historical review presented in the preceding pages is evidence of the fact that the Association has changed its mind from time to time on this matter. The committees on botany, horticulture and others have disappeared, for the reason that men engaged in scientific work preferred to have their affiliations with scientific associations and could not well take the time to attend both classes of organizations.

It may be pertinent to say that the wide spread movement toward the development of all sorts of scientific, administrative and educational organizations and conventions makes a very heavy draft upon the institutions. Teachers feel that they cannot afford to pay their own expenses to all these conventions, and the institutions feel that they cannot afford to have so many men absent from their ordinary duties for as much time as is necessary to meet the demand for attendance. Besides, the matter of expense is not inconsiderable. Reference to this report will show that experience demonstrated that the engineering men were not made delegates to this Association with sufficient frequency and regularity to give a section on mechanic arts the diginity and strength in the Association to which the work was entitled. The Association is now considering whether it shall increase the number of delegates by multiplying the sections or committees so as to have practically two hundred or more men from these institutions assemble every year in convention.

Second. Sections may be created on a basis of practical equality, each one being recognized substantially as an institution, namely the college, the station, the extension division and the mechanic arts or engineering division. The theory on which this proposal has proceeded is that these subjects are of large administrative importance. If we eliminate particular subjects and confine the convention to administrative divisions, the Association would then become a body of administrative officers attended by presidents, deans, directors, superintendents, or by whatever other title the administrative officers of these institutions would be designated.

The logical result of this second method would be to recognize the parity of this subdivision. The opinion is here expressed that a good many people act upon the theory that mechanic arts is an administrative division on a parity with agriculture and that both of them somehow should be recognized as institutions. The fact is that the law does not recognize any such division. The Smith-Lever Act also recognizes that extension service is a subdivision of the institutions founded under the Act of 1862.

Reference to the discussions that have taken place in this Association as reported in the Proceedings from year to year, will disclose the fact that a considerable proportion of the men attending this convention for the last twenty years has been disposed to recognize the stations as separate institutions and thus to have in their mind two divisions, namely, the college and the station. There is some justification for the belief that this Association has shown a tendency to regard itself as exclusively agricultural and to ignore the division of mechanic arts. The success before Congress in passing distinctive agricultural measures has given rise to the belief that the Asso-

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ciation's endorsement of engineering measures, while sincere, has not carried with it the same sort of activity in their support as has characterized its endorsement of distinctly agricultural proposals. The men representing mechanic arts or engineering believe that federal aid should be vouchsafed to this division of the work in due time. They have not been opposed or indifferent to the appropriations for agricultural purposes, but they believe sincerely that an aggressive movement should be started looking toward federal aid for engineering experiment stations and for engineering extension work. This will raise the question sooner or later whether a new section on engineering extension work shall be provided within this Association. The fact that in some states the universities and colleges of agriculture are separate has developed a situation as to mechanic arts and engineering that may make it impossible ever to secure federal aid for mechanic arts or engineering. It certainly becomes important that this Association should face this problem and face it squarely. This is infinitely more important than the technical question of amending the Constitution. If the agricultural portion of the Association is at heart opposed to federal aid for mechanic arts work and to the development of money for extension in mechanic arts parallel to the work in the Smith-Lever Act, that fact should be frankly and publicly stated. The truth is that some states are now spending considerable revenue in general university extension and in the future probably they will expend more. It is worth while to consider whether these so-called land-grant colleges, together with such of the state universities as have been developed around the college of agriculture and mechanic arts as in Ohio for example, by a close cooperation shall develop teaching as represented in the college, research as represented in the experiment stations, for both agriculture and engineering, and extension work as represented by agriculture and mechanic arts, or whether they shall allow this general field to be ignored or neglected. Possibly it may not be neglected, but these institutions eventually will be held responsible for the organization of all these scientific and educational activities.

Attention may be directed now to the fact that every year a considerable number of associations more or less technical and scientific in character meet at the same time and place as this Association. Reference to the program will find several of these organizations announced this year. It is evident that these societies are composed chiefly of men associated with the United States Department of Agriculture, Bureau of Education and the group of colleges represented in this Association. Whether all these organizations ought to be federated in a great national convention because they represent public national interests, is in the minds of many a somewhat important question. This would make necessary the discussion of scientific, technical, and educational questions rather than administrative questions and problems of public policy. While it is perfectly obvious that this Association has tended to become administrative in character, it is equally obvious that associations for the discussion of scientific and educational questions have continued to develop. It is also true that the program of this Association has shown a decided preference for the administrative features. Reference to the Proceedings of 1914, page 233 and 234, will disclose some keen criticism of the program committee of one of the sections for including what might be termed technical papers. In view of all these tendencies it would seem that the Association should regard its future as administrative and make its organization accordingly. Any other policy involves a complete revolution and a new organization.

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Conclusion: In view of the considerations reported above, the chairman, speaking for the Executive Committee without formal approval, suggests that the Association should not at this time undertake to amend the Constitution in a specific way. On the other hand the Committee believes that it would be well for the Association to settle by vote the general issue as to the policy the Association represents. In determining this question the opinion is expressed that the Association should keep in mind whether the future is to involve the question of engineering experiment stations and engineering extension service as well as agricultural experiment stations and agricultural extension work. This would make at least five sections in the Association. It will be recalled that the Association made provision for a committee on extension organization and policy before the passage of the Smith-Lever Act. Reference to the Proceedings will also show that the original idea of extension work was rather limited and meager in 1905, but that the idea steadily developed through the several reports presented to the Association and now is a matter of incomplete statement. There is no good reason, therefore, why the Association should not now make provision for engineering extension service, provided the separate organization of the mechanic arts or engineering division, now known as the Land-Grant College Engineering Association, is not to be continued but is included in the work of this Association.

The purpose of this statement is to bring before the Association a brief account of its own experiences, to intimate what its own positions have been, and to present the issue now raised by the proposed affiliation or absorption of the Land-Grant College Engineering Association. There is no need of further amendment unless that organization is to be included in this Association. If it is to be included, then the Constitution should be re-written on the basis of the Act of 1862 and provision made for an Association of these institutions that should deal chiefly with administrative problems. The history of the Association goes clearly to show that discussion of scientific and technical questions has been referred to scientific and technical organizations. The committee, therefore, recommends that the Association settle by vote the one question of policy, and then, as seems best, refer the matter of amending or re-writing the Constitution to the Executive Committee, or to a special committee appointed for that purpose.

Respectfully submitted,

W. O. THOMPSON,

Chairman Executive Committee.

On motion, the report of the Executive Committee was received.

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The report of the treasurer was submitted by J. L. Hills of Vermont, as follows:

REPORT OF THE TREASURER

Nov. 11, 1914—Aug. 11, 1915

RECEIPTS

To balance on hand, Washington meeting	$ 330.64
To 49 dues from colleges	1,715.00
To 49 dues from stations	980.00
To 6 dues from colleges (previous years)	210.00
To one dues from station (previous year)	20.00
To refund from University of Missouri on account Graduate School of Agriculture	398.75
Total receipts	$3,654.39
Disbursements as per statement	$3,237.43
Balance on hand, August 11, 1915	$ 416.96

DISBURSEMENTS

Executive committee	$ 269.82
Committee on extension work	286.41
Graduate school committee	34.34
Secretary-treasurer	50.49
Proceedings twenty-eighth convention (printing, proofreading, stenographers, expressage, postage, programs, badges, etc.,)	1,096.37
Certificate of deposit	1,500.00
Total disbursements	$3,237.43

ASSETS

Cash on hand in bank	$ 416.96
Three (3) certificates of deposit (City Trust Co.)	4,500.00
Forty-two months interest at 4 percent on $1,500	210.00
Thirty-seven months interest at 4 percent on $1,500	185.00
Five months interest at 4 percent on $1,500	25.00
	$5,336.96

The treasurer further stated that he proposed, if re-elected, to convert in January, 1915, the three certificates of deposit for $4,500, together with the then accrued interest of $500, into two certificates, one of $3,000 and the other of $2,000, in order that the simple interest may be set at work, and to use the latter certificate, less its interest accumulations, in July 1915 to pay the association's graduate school contribution.

On motion, the report of the treasurer was referred to an auditing committee consisting of M. A. Brannon of Idaho, E. A. Burnett of Nebraska, and R. J. Aley of Maine which, later, reported as follows:

The auditing committee has examined the accounts of the treasurer and found the same to be correct. All vouchers properly approved and receipted have been found on file. It also finds a bank balance as stated of

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$416.96, and finds in the treasurer's hands three (3) certificates of deposit totaling $4,500, dated February 24 and July 10, 1912 and March 12, 1915, bearing simple interest at the rate of 4 percent per annum.

M. A. Brannon,
E. A. Burnett,
R. J. Alley,
Auditing Committee.

On motion, the report of the auditing committee was received and adopted.

Report of the Bibliographer

By A. C. True

The passage of the Smith-Lever Agricultural Extension Act has marked so important an era in the history of the institutions represented in this Association that upon the present occasion it seems useful and timely to present as the bibliographer's report a list of documents that record the history of this legislation, together with a brief summary of the chief factors instrumental in bringing it about.

The recent or direct history of the development of farmers' cooperative demonstration work together with the propaganda and legislative deliberations that culminated in the Smith-Lever Act follows in the main two converging lines. One of these lines represents the demonstration work of the United States Department of Agriculture begun by Dr. S. A. Knapp for the cotton growing states, expanding into cooperative work with the General Education Board and other organizations, and inspiring similar work for the non-cotton growing states as well as demonstration work in special subjects which has been carried on by a variety of agencies within the same Department. The second line of development follows the course of progress in the organization of the extension work carried on by the state colleges of agriculture and by farmers' institutes, leading to the creation of a standing committee and, subsequently a section on extension work in this Association, and thereby to the drafting and passage of the federal legislation that has combined these two lines of endeavor into a single method, uniform for all states and giving assurance that the work, both federal and state, may be conducted in a way most advantageous alike to workers and to beneficiaries.

To trace the more remote and less direct history of the progress of agricultural extension work would necessitate recourse to a great variety of sources of information extending over a long period of years, so many and so diverse have been the factors contributing to its growth and support and so long has this method of instructing farmers been in use. This movement has been aided and encouraged by commercial, financial and educational interests as well as by national, state and local agricultural organizations. Agricultural fairs and farmers' institutes represent some of its earliest forms. Extension work was done in the agricultural colleges and experiment stations long before it became recognized by that name and certain forms of cooperative experimental work with farmers on their own farms was undertaken by some of the stations very soon after their foundation. The most effective method of presenting the results of station work to farmers is a theme that frequently has been accorded the attention of this Association.

The first account of the present form of farmers' cooperative demonstration work in the United States Department of Agriculture occurs in a recom-

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mendation of the Secretary of Agriculture in 1903[1] of this plan of relief for disastrous agricultural conditions in Louisiana and Texas due to the ravages of the cotton boll weevil. Under the terms of an appropriation for the year 1903-1904 the employment of demonstration methods for this purpose was made possible and field work was placed under the direction of Dr. S. A. Knapp, who conceived the idea of conducting demonstration on the farmer's own premises instead of using for the purpose a government-owned farm to which the farmer must be brought. Once begun, the value of this work was so striking that cooperation in its operation and support was readily secured, not only from agricultural colleges and experiment stations but also from counties, railroads, boards of trade and local organizations of every kind.

Its development may be traced in subsequent annual reports [2] and other publications of the Bureau of Plant Industry, in the annual hearings before the Committee on Agriculture of the House of Representatives and its counterpart in the Senate on the estimates of appropriations for the United States Department of Agriculture, as well as in special hearings on boys' and girls' club work. An account also has been published by the General Education Board [3], whose generous contributions dating from 1906 aided materially in carrying this service into new territory.

In 1896 the organization was effected of an association under the name of the American Association of Farmers' Institute Workers (previous to 1899, Farmers' Institute Managers), one of whose earliest efforts was directed toward securing in the United States Department of Agriculture a division devoted wholly to the interests of farmers' institutes. Finally in 1903 a specialist was appointed in the Office of Experiment Stations whose entire time was given to this work.

The history of farmers' institutes in the United States may be found in Bulletins 79 [4] and 174 [5] of the Office of Experiment Stations, in the proceedings [6] of their association, and in the accounts of the "Progress of Farmers' Institutes" which have been published annually by the Office of Experiment Stations, beginning with 1902.[7]

Since 1911, these accounts also include reports on extension work of other kinds which had been treated previously in occasional special articles in the annual reports of the same office or were incidentally included in the section

[1] U. S. Dept. Agr., An. Rpts. for 1902-03, pp. civ-cviii; U S. Dept. Agr., Off. Sec'y, Rpt. 76 (1903) pp. 88-91.

[2] These were issued separately and were also included in the Annual Reports of the United States Department of Agriculture. The following may also be consulted: U. S. Dept. Agr., Farmers' Buls. 319, 385, 422; U. S. Dept. Agr., Off. Secty, Circ. 33: U. S. Dept. Agr., Yearbooks 1909, pp. 153-160: 1911, pp. 151-154, 285-296; U. S. 63d. Cong., 2d. Sess., Sen. Doc. 537. (Contains proceedings of the fourth annual convention of tthe Southern Commercial Congress, April 9, 1912, arranged as a memorial to Dr. Seaman A. Knapp.)

[3] The General Education Board, an account of its activities 1902-1914, 240 pp. New York, General Education Board, 1915. "Farm demonstrations; boys' and girls' clubs", pp. 18-70.

[4] Bailey, L. H. Farmers' Institutes; history and status in the United States and Canada. 34 p. Washington Govt. Print. Off., 1900. (U. S. Dept. Agr., Off. Exp. Stas., Bul. 79.)

[5] Hamilton, John. History of farmers' institutes in the United States. 96 p. Washington Govt. Print. Off., 1906. (U. S. Dept. Agr., Off. Exp. Stas. Bul. 174.)

[6] The Association was organized March 18, 1896, under the name "International Association of Farmers' Institute Workers", changed to "American Association of Farmers' Institute Managers" at the first annual meeting, and in 1899 to the present name. The first annual meeting was held Oct. 14-15 of the same year, and an account of this, and of the previous meeting was published in one volume by the Secretary, F. W. Taylor, for the use of members. Subsequent reports are as follows: 2, 1897, issued separately; 3, 1898 not printed; 4, 1899, in 58th annual report of the New York State Agricultural Society for 1898: 5, 1900, in Wisconsin Farmers' Institutes Bulletin 14, 1900; 6-17, 1900-1912, are United States Department of Agriculture, Office of Experiment Stations Bulletins 110, 120, 138, 154, 165, 182, 199, 213, 225, 238, 251, 256; 18-19, 1913-1914, separately published by the Association.

[7] 1902-12 in Annual Reports of the Office of Experiment Stations, U. S. Department of Agriculture as follows: 1902 pp. 461-480; 1903 pp. 635-687; 1904 pp. 617-675; 1905 pp. 359-413; 1906 pp. 301-357; 1907 pp. 307-354; 1908 pp. 289-335; 1909 pp. 327-359; 1910 pp. 387-424; 1911 pp. 343-388; 1912 pp. 333-383.

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of these reports entitled "Progress of Agricultural Education", which had appeared annually beginning with 1902.

The history of extension work in the state agricultural colleges also may be traced in the Proceedings of this Association, more especially in the reports of the committee on extension work. This committee was established as a standing committee in 1904, and in 1909 a section of extension work was formed. In the same year the committee outlined a plan for a proposed national appropriation for agricultural extension work.

On December 15, 1909, a bill that embodied this plan was introduced by Mr. McLaughlin (H. R. 15422, U. S. 61st. Cong., 2d. Sess.) but never was reported from the committee to which it was referred. Mr. McLaughlin's second bill (H. R. 15256, U. S. 62d. Cong., 2d. Sess.) introduced December 9, 1911, met with a similar experience. Apart from those representing the lineal antecedents of the Smith-Lever bill, the measures most discussed were the McKinley bill introduced Aug. 10, 1911 (H. R. 13489, U. S. 62d. Cong., 1st. Sess.,and H. R. 14928, U. S. 62d.Cong., 2d. Sess.) and the Dolliver bill introduced June 22, 1910 (S. 8809, U. S. 61st. Cong., 2d. Sess.). The latter was offered by the Senate Committee on Agriculture and Forestry as a substitute for and combination of two bills (S. 4675 and S. 4676, U. S. 61st. Cong., 2d. Sess.) introduced by Mr. Dolliver, one of which had provided for agricultural extension work and the other for vocational education. By the time the sixty-second Congress opened, the subject of federal appropriation in aid of agricultural extension, or demonstration work, had become so popular that bills in bewildering number were presented, all looking to the same end, but diverse in the means proposed for its accomplishment.

In January 1912, two bills, substantially the same, were introduced, the one in the Senate by Mr. Smith (S. 4563, U. S. 62d. Cong., 2d. Sess.) and the other in the House by Mr. Lever (H. R. 18160, U. S. 62d. Cong., 2d. Sess.) which contained practically the same provisions as those of the McLaughlin bill. Hearings were held on the Smith bill, but neither bill was reported from its committee. Subsequently Mr. Lever and Mr. Smith again introduced bills on the lines of the earlier ones but in modified form. Of these, Mr. Lever's bill was amended by the House, and was passed after much discussion. When it reached the Senate, however, a substitute was adopted in the form of S. 3, U. S. 62d, Cong., 1st. Sess., submitted by Mr. Page, which combined appropriations for agricultural extension work with those for vocational education in that and other industries.

This bill already had a long history. It had been introduced originally by Mr. Page, April 6, 1911, and referred to the Senate Committee on Agriculture, where it was found to be in need of revision in order to conform its provisions to those of laws in force in the several states. Mr. Page, therefore was appointed a sub-committee of one to conduct correspondence and submit amendments. The amended bill was reported to the Senate and debated and in June 1912 a substitute, with the same number but amended title, was offered by Mr. Page and accepted by the Senate, and it was in this form that the bill was offered as a substitute for the Lever bill. At this time so confused had become the lines of demarcation between different bills, that debates in both Houses of Congress had assumed the character of a general discussion of the whole field of national support to agricultural extension and vocational education and the principles involved therein, rather than of deliberations on a definite measure. Friends of the Smith-Lever bills became more and more strongly convinced that it would be wiser to deal with vocational education and extension work in separate bills, and the substitution accepted by the Senate was disagreed to by the

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House. The bill went to conference but no further action upon it was taken.

Finally, in the Sixty-third Congress, the same bill, with modifications, was introduced concurrently by Mr. Smith (S. 3091, U. S. 63d. Cong., 1st. Sess.) and by Mr. Lever (H. R. 7951, U. S. 63d. Cong., 1st. Sess.) in the Senate and in the House respectively. The latter bill passed the House, was substituted in the Senate for S. 3091, passed the Senate, was duly signed by the President, and became a law.

An annotated list of bills and other matter relating to proposed and actual federal legislation on agricultural extension work from December 1909 to December 1913 is appended. The bills are arranged chronologically in order of dates of introduction. Following the title of each bill, historical notes, hearings, reports and discussions held during the convention of this Association are given in the order named. As the discussions are frequently general or include a number of different bills, their arrangement is necessarily somewhat arbitrary. To obviate this difficulty and to make clearer the relations of the various bills to each other, frequent cross references are made by means of the serial numbers with which the entries are provided.

Bills Relating to Agricultural Extension

introduced in congress dec. 15, 1909 to dec. 12, 1913

H. R. 15422, U. S. 61st. Cong., 2d. Sess., Dec. 15, 1909.

(1) McLaughlin, J. C. A bill for increase of appropriation to agricultural colleges for extension work. 7 p. [Washington, Govt. print. off., 1909].

Introduced by Mr. McLaughlin of Michigan, referred to the Committee on agriculture Dec. 15, 1909; hearings held Feb. 24, 1910.

Identical with McLaughlin (25); similar to Lever (15); embodies a plan of legislation outlined by the Executive committee of the Association of American agricultural colleges and experiment stations (3).

For discussions see (8), (9), (20).

(2) U. S.—*Congress—House—Committee on Agriculture.* Hearings during the 2d. session of the 61st. Congress. 3 v. Washington, Govt. print. off., 1910.

"Increase of appropriation to agricultural colleges" [H. R. 15422, U. S. 61st Cong., 2d. Sess.] v. 3, p. 173-198.

Hearings held Feb. 24, 1910, Mr. C. F. Scott, chairman.

Statements of Dr. J. L. Snyder, President Michigan agricultural college, Dr. W. E. Stone, President Purdue University and Dr. W. O. Thompson, President Ohio state university and Chairman of the Executive committee of the Association of American agricultural colleges and experiment stations (v. 3, p. 173-192); Memorandum on the McLaughlin bill submitted on behalf of the Committee on extension work of the Association of American agricultural colleges and experiment stations, Dr. K. L. Butterfield, chairman (v. 3, p. 193-198).

(3) Association of American agricultural colleges and experiment stations—*Committee on extension work.* Report [with discussion and action of the association thereon.] (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas. 23 (1909) p. 34-39, 72-79).

Dr. K. L. Butterfield, chairman. The plan adopted in the McLaughlin bill (1) is outlined in this report (p. 37-38) in accordance with preliminary suggestions made by the committee in their report of the previous year (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas. 22 (1908) p. 40-42).

S. 4676, U. S. 61st. Cong., 2d. Sess., Jan. 5, 1910.

(4) Dolliver, J. P. A bill to provide for an increased annual appropriation for the support of colleges for the benefit of agriculture established under the provisions of an act of Congress approved July 2, 1862, and regulating the expenditure thereof, and making appropriation to enable the Department of

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Agriculture to investigate, demonstrate, and report upon methods of extension work. 7 p. [Washington, Govt. print. off., 1910].

Introduced by Senator Dolliver of Iowa, referred to the Committee on agriculture and forestry Jan. 5, 1910; hearings held Feb. 24; reported from the committee (7) June 22 with the recommendation that the bill be superseded by S. 8809 (6) which combines the provisions of this bill with those of S. 4675 (Dolliver).

(5) U. S.—*Congress—Senate—Committee on agriculture and forestry.* Agricultural colleges and experiment stations; hearing ... on the bill S. 4676, [U. S. 61st. Cong., 2d. Sess.] 14 p. Washington, Govt. print. off., 1910.

Hearings held Feb. 24, 1910, Senator Dolliver, chairman; statements of Dr. C. F. Curtiss, Dean of agriculture, Iowa state college and Dr. W. H. Jordan, Director New York state agricultural experiment station, representing the Executive committee of the Association of American agricultural colleges and experiment stations.

S. 8809 U. S. 61st. Cong., 2d. Sess., June 22, 1910.

(6) Dolliver, J. P. A bill to cooperate with the states in encouraging instruction in agriculture, the trades and industries, and home economics in secondary schools; in maintaining extension departments in state colleges, and in preparing teachers for these vocational subjects in state normal schools; and to appropriate money and regulate its expenditure. 13 p. [Washington, Govt. print. off., 1910].

Reported by the Senate committee on agriculture and forestry June 22, 1910, Senator Dolliver of Iowa, chairman, as a substitute for S. 4675 and S. 4676, Dolliver (4), combining the provisions of both; placed on calendar "under Rule IX" Jan. 11, 1911, the author having died. S. 4675 made provision for vocational education in schools and does not appear in this list.

Identical or practically so with Page (10), Page (11, original form), Wilson (16), Godwin (26), Anderson (27), Goodwin (34), Goodwin (51).

(7) U. S.—*Congress—Senate—Committee on agriculture and forestry.* Cooperation with the states in providing vocational education, June 22, 1910 ....Report to accompany S. 8809. 5 p. [Washington, Govt. print. off., 1910]. (U. S. 61st. Cong., 2d. Sess., Senate Report 902).

Submitted by Senator Dolliver; introduces S. 8809 (6), explains its provisions and enumerates organisations formally endorsing the bill.

(8) Hamilton, John. Some of the problems of extension work in American agricultural colleges. I. Financial support. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas. 24 (1910) p. 81-82.)

Read Nov. 17, 1910, as part of the report of the Committee on extension work of the Association of American agricultural colleges and experiment stations; compares McLaughlin (1) with Dolliver (6).

(9) Association of American agricultural colleges and experiment stations. A round table discussion of Senate bill 8809....led by W. E. Stone. (Proc. Asso. Amer. Agr. Colleges and Exper. Stas. 24 (1910) p. 93-106).

Held Nov. 17, 1910; compares McLaughlin (1) with Dolliver (6).

S. 10905, U. S. 61st. Cong., 3d. Sess., March 3, 1911.

(10) Page, C. S. A bill to cooperate with the states in encouraging instruction in agriculture, the trades and industries, and home economics in secondary schools; in maintaining instruction in these vocational subjects in state normal schools; in maintaining extension departments in state colleges of agriculture and mechanic arts; and to appropriate money and regulate its expenditure. 13 p. [Washington, Govt. print. off., 1911].

Introduced by Senator Page of Vermont, referred to the Committee on agriculture and forestry March 3, 1911.

Identical or practically so with Dolliver (6), Page (11, original form), Wilson (16), Godwin (26), Anderson (27), Goodwin (34), Goodwin (51).

S. 3, U. S. 62d. Cong., 1st. Sess., April 6, 1911.

(11) Page, C. S. A bill to cooperate with the states in encouraging instruction in agriculture, the trades and industries, and home economics in secondary schools; in maintaining instruction in these vocational subjects in state normal schools; in maintaining extension departments in state colleges

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of agriculture and mechanic arts; and to appropriate money and regulate its expenditure. 16 p. [Washington, Govt. print. off., 1911].

Introduced by Senator Page of Vermont, referred to the Committee on agriculture and forestry April 6, 1911; reported with amendments (12) Feb. 26, 1912; debated June 5; an amended bill substituted by Mr. Page June 14, 1912 (45) *q. v.* for subsequent history.

The original form identical or practically so with Dolliver (6); Page (10), Wilson (16), Godwin (26), Anderson (27), Goodwin (34), Goodwin (51); amended form of Feb. 26, 1912, similar to Wilson (35).

For discussions see (19), (20).

(12) U. S.—*Congress—Senate—Committee on agriculture and forestry.* Vocational education, February 26, 1912....Report to accompany S. 3. 75 p. [Washington, Govt. print. off., 1912]. (U. S. 62d. Cong., 2d. Sess., Senate Report 405).

Submitted by Mr. Page; includes a subcommittee report containing extracts from correspondence and endorsements of the bill by educational, agricultural and commerical officials and organisations.

(13) U. S.—*Congress—Senate—Committee on agriculture and forestry.* Vocational education; report of the subcommittee of the Committee on agriculture and forestry, United States Senate 62d. Congress, on Senate bill 3. 71 p. Washington, Govt. print. off., 1912.

Submitted by Senator Page; includes extracts from correspondence and endorsements of the bill.

H. R. 10865, U. S. 62d. Cong., 1st. Sess., May 30, 1911.

(14) McHenry, J. G. A bill for the advancement of agriculture. 3 p. [Washington, Govt. print. off., 1911].

Introduced by Mr. McHenry of Pennsylvania, referred to the Committee on agriculture, May 30, 1911.

H. R. 11542, U. S. 62d. Cong., 1st. Sess., June 12, 1911.

(15) Lever, A. F. A bill to establish agricultural extension departments in connection with the agricultural colleges and experiment stations in the several states receiving the benefits of an act of Congress approved March 2, 1887. 6 p. [Washington, Govt. print. off., 1911].

Introduced by Mr. Lever of South Carolina, referred to the Committee on agriculture June 12, 1911.

Similar to McLaughlin (1) and (25). For other bills by the same author see (30), (36), (50), (54).

For discussions see (19), (20).

H. R. 12156, U. S. 62d. Cong., 1st. Sess., June 29, 1911.

(16) Wilson, W. B. A bill to cooperate with the states in encouraging instruction in agriculture, the trades and industries, and home economics in secondary schools; in maintaining instruction in these vocational subjects in state normal schools; in maintaining extension departments in state colleges of agriculture and mechanic arts; and to appropriate money and regulate its expenditure. 13 p. [Washington, Govt. print. off., 1911].

Introduced by Mr. Wilson of Pennsylvania, referred to the Committee on agriculture, June 29, 1911.

Identical or practically so with Dolliver (6), Page (10), Page (11, original form), Godwin (26), Anderson (27), Goodwin (34), Goodwin (51).

H. R. 13489, U. S. 62d. Cong., 1st. Sess., Aug. 10, 1911.

(17) McKinley, W. B. A bill to provide for increased annual appropriations to the several states for the agricultural colleges established under the provisions of an act approved July 2, 1862, and for the demonstration of practical and scientific methods of agriculture. 3 p. [Washington, Govt. print. off., 1911].

Introduced by Mr. McKinley of Illinois, referred to the Committee on agriculture Aug. 11, 1911.

For a modified form introduced Dec. 7, 1911 see (24).

(18) Davenport, E. Shall we ask for further legislation in the interest of agriculture? If so, what? (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas., 25 (1911) p. 76-80).

Read Nov. 16, 1911; formulates guiding principles, does not discuss specific bills.

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(19) Stone, W. E. Pending federal legislation. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas., 25 (1911) p. 81-82).
Read Nov. 16, 1911; discusses Page (11), Lever (15) and McKinley (17) bills.

(20) Hunt, T. F. Pending federal legislation. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas. 25 (1911) p. 82-85).
Read Nov. 16, 1911; discusses McLaughlin (1), Page (11), Lever (15), and McKinley (17) bills.

(21) Hays, W. M. [Federal legislation for agricultural extension and vocational education]. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas. 25 (1911) p. 86-89).
Read Nov. 16, 1911: treats the subject in a general way without reference to any specific measure.

(22) Claxton, P. P. [Federal legislation for agricultural extension and vocational education]. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas., 25 (1911) p. 89-94).
Read Nov. 16, 1911.

(23) Association of American agricultural colleges and experiment stations—*Executive committee.* Report....[together with supplementary report of the Committee on extension work relative to federal appropriations and the discussion and action of the association thereon]. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas., 25 (1911) p. 114-124).
Submitted Nov. 17, 1911, Dr. W. O. Thompson, chairman.

H. R. 14928, U. S. 62d. Cong., 2d. Sess., Dec. 7, 1911.

(24) McKinley, W. B. A bill to provide for increased annual appropriations to the several states for the agricultural colleges established under the provisions of an act approved July 2, 1862 and for the demonstration of practical and scientific methods of agriculture. 3 p. [Washington, Govt. print. off., 1911).
Introduced by Mr. McKinley of Illinois, referred to the Committee on agriculture Dec. 7, 1911; a modified form of (17).

H. R. 15256, U. S. 62d. Cong., 2d. Sess., Dec. 9, 1911.

(25) McLaughlin, J. C. A bill for increase of appropriation to agricultural colleges for extension work. 6 p. [Washington, Govt. print. off., 1911].
Introduced by Mr. McLaughlin of Michigan, referred to the Committee on agriculture Dec. 9, 1911.
Identical with McLaughlin (1); similar to Lever (15).

H. R. 15458, U. S. 62d. Cong., 2d. Sess., Dec. 12, 1911.

(26) Godwin, H. L. A bill to cooperate with the states in encouraging instruction in agriculture, the trades and industries, and home economics in secondary schools; in maintaining instruction in these vocational subjects in state normal schools; in maintaining extension departments in state colleges of agriculture and mechanic arts, and to appropriate money and regulate its expenditure. 13 p. [Washington, Govt. print. off., 1911].
Introduced by Mr. Godwin of North Carolina, referred to the Committee on agriculture Dec. 12, 1911.
Identical or practically so with Dolliver (6), Page (10), Page (11, original form), Wilson (16), Anderson (27), Goodwin (34), Goodwin (51).

H. R. 16842, U. S. 62d. Cong., 2d. Sess., Jan. 4, 1912.

(27) Anderson, C. C. A bill to cooperate with the states in encouraging instruction in agriculture, the trades and industries, and home economics in secondary schools; in maintaining instruction in these vocational subjects in state normal schools; in maintaining extension departments in state colleges of agriculture and mechanic arts; and to appropriate money and regulate its expenditure. 13 p. [Washington, Govt. print. off., 1912].
Introduced by Mr. Anderson of Ohio, referred to the Committee on agriculture Jan. 4, 1912.
Identical or practically so with Dolliver (6), Page (10), Page (11, original form), Wilson (16), Godwin (26), Goodwin (34), Goodwin (51).

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S. 4563, U. S. 62d. Cong., 2d. Sess., Jan. 16, 1912.

(28) Smith, Hoke. A bill to establish agricultural extension departments in connection with the agricultural colleges in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 7 p. [Washington, Govt. print. off., 1912].

Introduced by Senator Smith of Georgia, referred to the Committee on agriculture and forestry, Jan. 16, 1912; hearings held March 1 and 5, 1912.

Practically or identical with Lever (30); for subsequent bills by the same author see (48), (52).

(29) U. S.—*Congress—Senate—Committee on agriculture and forestry.* To establish agricultural extension departments; hearings... 62d. Congress, 2d. Session, on S. 4563. 83 p. [Washington, Govt. print. off., 1912].

Hearings held March 1, 5, Senator Henry E. Burnham, chairman, hearings conducted by Senator Smith; statements of Dr. H. L. Russell, Dean of the College of agriculture, University of Wisconsin, Dr. Howard Edwards, President Rhode Island state college, Dr. A. M. Soule, President of Georgia state college of agriculture, Mr. B. F. Harris, President, Illinois bankers' association, Prof. T. C. Adkeson, member of the Legislative committee of the National grange, Mr. J. R. Chapman, jr., President Northwestern national bank, Minneapolis, Mr. Oliver Wilson, President National Grange, Mr. Wesley C. McDowell, Chairman of the Excutive council, North Dakota banker's association, Dr. W. D. Gibbs, President New Hampshire college of agriculture and mechanic arts, Mr. H. H. Gross, President National soil fertility league, Dr. W. O. Thompson, President Ohio State University and representing the Association of American Agricultural colleges and experiment stations, Senator Page of Vermont.

H. R. 18160, U. S. 62d. Cong., 2d. Sess., Jan. 17, 1912.

(30) Lever, A. F. A bill to establish agricultural extension departments in connection with agricultural colleges in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 6 p. [Washington, Govt. print. off., 1912].

Introduced by Mr. Lever of South Carolina, referred to the Committee on agriculture Feb. 17, 1912; hearings held Feb. 29, March 1, 2, 1912.

Practically identical with Smith (28); for other bills by the same author see (15), (36), (50), (54).

(31) U. S.—*Congress—House—Committee on agriculture.* Agricultural extension departments; hearings....on H. R. 18160 [U. S. 62d. Cong., 2d. Sess.] and various other bills relating to agricultural extension. 66 p. [Washington, Govt. print. off., 1912.] (*Also in* U. S.—*Congress—House—Committee on agriculture.* Hearings....62d. Congress, 2d. and 3d. Sessions, on miscellaneous bills. Washington, 1913 p. 109-171.)

Hearings held Feb. 29, March 1, 2, 1912, John Lamb chairman; covers the whole subject of federal aid for agricultural extension and is not limited to definite bills of which the chairman states there are 16 pending; statements of Dr. K. L. Butterfield, President of Massachusetts agricultural college, Dr. A. M. Soule, President Georgia state college of agriculture, Mr. B. F. Harris, Vice-president, First national bank, Champaign, Ill., Mr. Joseph Chapman jr., Chairman of the Committee of agricultural development of the American banker's association, Mr. H. H. Gross, President National soil fertility league, Dr. Howard Edwards, President Rhode Island state college, Hon. Myron T. Herrick, U. S. ambassador to France, Mr. Oliver Wilson, Master of the National grange, Prof. T. C. Adkeson, of the Legislative committee of the National grange, Mr. Wesley C. McDowell, Chairman of the Executive council of the North Dakota bankers' association, Dr. H. J. Patterson, Director Maryland agricultural experiment station, Dr. H. L. Russell, Dean of the College of agriculture, University of Wisconsin, Dr. W. O. Thompson, President Ohio state university and Chairman of the Executive committee of the Association of American agricultural colleges and experiment stations.

S. 4834, U. S. 62d. Cong., 2d. Sess., Jan. 25, 1912.

(32) Owen, R. L. A bill to establish agricultural extension departments in connection with the agricultural colleges in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 6 p. [Washington, Govt. print. off., 1912].

Introduced by Senator Owen of Oklahoma, referred to the Committee on agriculture and forestry, Jan. 25, 1912.

Identical with Morgan (33).

H. R. 20282, U. S. 62d. Cong., 2d. Sess., Feb. 16, 1912.

(33) Morgan, D. T. A bill to establish agricultural extension departments in connection with the agricultural colleges in the several states receiving

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the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 6 p. [Washington, Govt. print. off., 1912.]

Introduced by Mr. Morgan of Oklahoma, referred to the Committee on agriculture, Feb. 16, 1912.

Identical with Owen (32).

H. R. 20476, U. S. 62d. Cong., 2d. Sess., Feb. 20, 1912.

(34) Goodwin, W. S. A bill to cooperate with the states in encouraging instruction in agriculture, the trades and industries, and home economics in secondary schools; in maintaining instruction in these vocational subjects in state normal schools; in maintaining extension departments in state colleges of agriculture and mechanic arts; and to appropriate money and regulate its expenditure. 13 p. [Washington, Govt. print. off., 1912].

Introduced by Mr. Goodwin of Arkansas, referred to the Committee on agriculture Feb. 20, 1912.

Identical or practically so with Dolliver (6), Page (10), Page (11, original form), Wilson (16), Godwin (26), Anderson (27), Goodwin (51).

H. R. 21490, U. S. 62d. Cong., 2d. Sess., March 7, 1912.

(35) Wilson, W. B. A bill to cooperate with the states in encouraging instruction in agriculture, the trades and industries, and home economics in secondary schools; in preparing teachers for these vocational courses in state colleges of agriculture and the mechanic arts; in maintaining instruction in these vocational subjects in state normal schools; in maintaining extension departments in state colleges of agriculture and the mechanic arts; and to appropriate money and regulate its expenditure. 15 p. [Washington, Govt. print. off., 1912].

Introduced by Mr. Wilson of Pennsylvania, referred to the Committee on agriculture March 7, 1912.

Similar to Page (11), as reported with amendments from the Committee on agriculture and forestry Feb. 12, 1912; for other bills by the same author see (16), (43).

H. R. 22871, U. S. 62d. Cong., 2d. Sess., April 4, 1912.

(36) Lever, A. F. A bill to establish agricultural extension departments in connection with agricultural colleges in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 7 p. [Washington, Govt. print. off., 1912].

Introduced by Mr. Lever of South Carolina, referred to the Committee on agriculture April 4, 1912; reported with amendment April 13, 1912 (37); debated Aug. 13, 22, 23; amended and passed the House Aug. 23; referred to Senate committee on agriculture and forestry Aug. 24; reported from Senate committee with amendments Dec. 14 (38); debated Dec. 3, 18, 1912, Jan. 2, 17, 1913; S. 3, Page (45) offered as a substitute Jan. 17; substitute withdrawn and resubmitted in amended form Jan. 24; debated in connection with Page (45) Jan. 24, 27; amended Jan. 27; the Page bill as amended Jan. 27 accepted as a substitute Jan. 29; Senate amendment [i. e. substitution of Page bill] disagreed to and conference asked by House Feb. 6; conference agreed to by Senate Feb. 7; a motion made Mar. 2, 3, 4 that the Senate recede from the amendment and pass the House bill was not acted upon; further endorsement read in Senate April 17, 1913.

The amended form reported by the Senate committee Dec. 14, 1912, identical with Smith (48); for other bills by the same author see (15), (30), (50), (54).

(37) U. S.—*Congress—House—Committee on agriculture.* Establishment of agricultural extension departments, April 13, 1912...Report to accompany H. R. 22871. 7 p. [Washington, Govt. print. off., 1912]. (U. S. 62d. Cong., 2d. Sess., House of Representatives Report 546).

Submitted by Mr. Lever.

(38) U. S.—*Congress—Senate—Committee on agriculture and forestry.* Establishment of agricultural extension departments, Dec. 14, 1912 ...Report to accompany H. R 22871. 14 p. [Washington, Govt. print. off., 1912]. (U. S. 62d. Cong., 2d. Sess., Senate Report 1072).

Submitted by Mr. Smith; contains abstracts of endorsements of the bill as it was first introduced as H. R. 18160, U. S. 62d. Cong., 2d. Sess. Lever (30).

(39) Smith, Hoke. [Statement regarding H. R. 22871, U. S. 62d. Cong., 2d. Sess., Nov. 13, 1912]. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas., 26 (1912), p. 18-19).

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(40) Association of American agricultural colleges and experiment stations—*Committee on extension work.* Federal aid. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas., 26 (1912) p. 63).

Part of the report of the committee, Dr. A. M. Soule, chairman.

(41) Association of American agricultural colleges and experiment stations—*Executive committee.* Memorial to the United States Senate [urging passage of H. R. 22871]. (Cong. Record, 49 (1912-13). Pt. 1, p. 15; Proc. Assoc. Amer. Agr. Colleges and Exper. Stas., 26 (1912), p. 99-101).

The pagination given in the last named reference includes discussions and action taken by the association.

(42) Gross, H. H. [Statement regarding H. R. 22871, U. S. 62d. Cong., 2d. Sess., Nov. 14, 1912]. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas., 26 (1912), p. 101-104).

H. R. 23581, U. S. 62d. Cong., 2d. Sess., April 20, 1912.

(43) Wilson, W. B. A bill to provide for cooperation with the states in promoting instruction in agriculture, the trades and industries, and home economics in secondary schools; in preparing teachers for these vocational subjects in state colleges of agriculture and the mechanic arts, in state normal schools, and in other training schools for teachers supported by the public; in maintaining extension departments of state colleges of agriculture and the mechanic arts; in maintaining branches of state experiment stations; and to appropriate money and regulate its expenditure. 28 p. [Washington, Govt. print. off., 1912].

Introduced by Mr. Wilson of Pennsylvania, referred to the Committee on agriculture April 20, 1912; hearings held April 23-26, 1912.

Practically identical with Page (45) and (47); a combination of Wilson (16) and (35).

(44) U. S.—*Congress—House—Committee on agriculture.* Vocational education; hearings on H. R. 23581 [U. S. 62d. Cong., 2d. Sess.] 152 p. [Washington, Govt. print. off., 1912]. (*Also in* U. S.—*Congress—House—Committee on agriculture.* Hearings on miscellaneous bills and other matters ....62d. Cong., 2d. and 3d. Sessions. Washington, 1913. p. 219-375).

Hearings held April 23, 24, 25, 26, 1912, John Lamb, chairman; gives statements of representatives of many agricultural educational and industrial organizations and institutions and a list of newspapers and periodicals that had formally endorsed the Page-Wilson bill.

S. 3, U. S. 62d. Cong., 2d. Sess., June 14, 1912.

(45) Page, C. S. A bill to provide for cooperation with the states in promoting instruction in agriculture, the trades and industries, and home economics in secondary schools; in preparing teachers for these vocational subjects in state colleges of agriculture and the mechanic arts, in state normal schools, and in other training schools for teachers supported and controlled by the public; in maintaining extension departments of state colleges of agriculture and the mechanic arts; in maintaining branches of state experiment stations; and to appropriate money and regulate its expenditure. 28 p. [Washington, Govt. print. off., 1912].

Presented by Senator Page of Vermont as a substitute for Page (11) which with reported amendments, was withdrawn by unanimous consent and the substitute placed on the calendar June 14, 1912; debated and amended July 24; debated Aug. 13, 19, 22; offered as a substitute for H. R. 22871 Lever (36) Jan. 17, 1913; debated in connection with Lever (36). Jan 17, 24, 27, 29, in the course of which debate the proposed substitute bill of Jan. 17 was replaced by an amended substitute of Jan. 24 whose first sections were identical with Lever (36); this substitute bill was further amended so that finally the form of the substitute accepted by the Senate and passed as H. R. 22871 was the above bill (45) as presented June 14, 1912; S. 3 indefinitely postponed Feb. 3, 1913; Senate amendment not accepted by the House and conference asked Feb. 6; conference agreed to in Senate Feb. 7.

Practically identical with Wilson (43) and Page (47).

H. R. 26083, U. S. 62d. Cong., 2d. Sess., Aug. 1, 1912.

(46) Flood, H. D. A bill to establish agricultural extension departments in connection with the agricultural colleges and high schools in the several

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states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 7 p. [Washington, Govt. print. off., 1912].

Introduced by Mr. Flood of Virginia, referred to the Committee on agriculture Aug. 1, 1912. Identical with Flood (49).

S. 3, U. S. 63d. Cong., 1st. Sess., April 7, 1913.

(47) Page, C. S. A bill to provide for cooperation with the states in promoting agricultural instruction in agriculture, the trades and industries, and home economics in secondary schools; in preparing teachers for these vocational subjects in state colleges of agriculture and the mechanic arts, in state normal schools, and in other training schools for teachers supported and controlled by the public, in maintaining extension departments of state colleges of agriculture and the mechanic arts; in maintaining branches of state experiment stations; and to appropriate money and regulate its expenditure. 28 p. [Washington, Govt. print. off., 1913].

Introduced by Senator Page of Vermont, referred to the Committee on agriculture and forestry April 7, 1913.

Practically identical with Wilson (43) and Page (45).

S. 46, U. S. 63d. Cong., 1st Sess., April 7, 1913.

(48) Smith, Hoke. A bill to establish agricultural extension departments in connection with agricultural colleges in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 7 p. [Washington, Govt. print. off., 1913].

Introduced by Mr. Bacon for Mr. Smith of Georgia, referred to the Committee on agriculture and forestry April 7, 1913.

Identical with Lever (36) in amended form as reported by the Senate committee on agriculture and forestry Dec. 14, 1912, and with Lever (50); for other bills by the same author see (28), (52).

H. R. 156, U. S. 63d. Cong., 1st. Sess., April 7, 1913.

(49) Flood, H. D. A bill to establish agricultural extension departments in connection with the agricultural colleges and high schools in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 7 p. [Washington, Govt. print. off., 1913].

Introduced by Mr. Flood of Virginia, referred to the Committee on agriculture, April 7, 1913.

Identical with Flood (46).

H. R. 1692, U. S. 63d. Cong., 1st Sess., April 7, 1913.

(50) Lever, A. F. A bill to establish agricultural extension departments in connection with agricultural colleges in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 7 p. [Washington, Govt. print. off., 1913].

Introduced by Mr. Lever of South Carolina, referred to the Committee on agriculture April 7, 1913.

Identical with Lever (36) as reported in amended form by the Senate committee Dec. 14, 1912, and with Smith (48); for other bills of the same author see (15), (30), (36), (54).

H. R. 2874, U. S. 63d. Cong., 1st Sess., April 17, 1913.

(51) Goodwin, W. S. A bill to cooperate with the states in encouraging instruction in agriculture, the trades and industries, and home economics in secondary schools; in maintaining instruction in these vocational subjects in state normal schools; in maintaining extension departments in state colleges of agriculture and mechanic arts; and to appropriate money and regulate its expenditure. 13 p. [Washington, Govt. print. off., 1913].

Introduced by Mr. Goodwin of Arkansas, referred to the Committee on agriculture April 17, 1913.

Identical or practically so with Dolliver (6), Page (10), Page (11, original form), Wilson (16), Godwin (26), Anderson (27), Goodwin (34).

S. 3091, U. S. 63d. Cong., 1st Sess., Sept. 6, 1913.

(52) Smith, Hoke. A bill to provide for cooperative agricultural extension work in the several states receiving the benefits of an act of Congress

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approved July 2, 1862, and of acts supplementary thereto and the United States Department of Agriculture. 7 p. [Washington, Govt. print. off., 1913].

Introduced by Senator Smith, referred to the Committee on agriculture and forestry Sept. 6, 1913; endorsements read and referred to the committee Oct. 7, 16, Nov. 3, 17; reported without amendments (53) Dec. 10, 1913; debated Jan. 17, 28, 1914; H. R. 7951 Lever (54) substituted Jan. 28, *q. v.* for subsequent history; S. 3091 indefinitely postponed Feb. 7, the substitute bill having passed the Senate.

A redraft of Smith (48), the result of a conference between the author, the Secretary of agriculture, and Mr. Lever; identical with Lever (54); for other bills by the same author see (28) (48); a modification of this bill is Tribble (60).

(53) U. S.—*Congress—Senate—Committee on agriculture and forestry.* Providing for cooperative agricultural extension work, Dec. 10, 1913.... Report to accompany S. 3091. 14 p. [Washington, Govt. print. off., 1913]. (U. S. 63d. Cong., 2d. Sess., Senate Report 139).

Submitted by Senator Smith; contains endorsements of this and of similar bills previously before Congress.

H. R. 7951, U. S. 63d. Cong., 1st. Sess., Sept. 6, 1913.

(54) Lever, A. F. A bill to provide for cooperative agricultural extension work between the agricultural colleges in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto, and the United States Department of Agriculture. 7 p. [Washington, Govt. print. off., 1913].

Introduced by Mr. Lever of South Carolina, referred to the Committee on agriculture Sept. 6, 1913; hearings held Sept. 23; reported with amendments (56) Dec. 8; debated, amended and passed the House Jan. 19, 1914; referred to Senate committee on agriculture and forestry Jan. 20; reported with amendment (57) Jan. 26; substituted in Senate for Smith (52) Jan. 28; debated Jan. 28, 29, 30, 31, Feb. 2, 5, 6, 7; amended and passed the Senate Feb. 7; Senate amendment disagreed to by House and conference asked Feb. 21; conference agreed to by Senate Feb. 25; conference report made and agreed to by Senate April 27, and by House May 2; examined and signed in House and Senate May 4; signed by the President of the United States May 8, 1914.

Identical with Smith (52); for other bills by the same author see (15), (30), (36), (50).

(55) U. S.—*Congress—House—Committee on agriculture.* Agricultural extension; hearings....63d. Congress, 1st Session, on H. R. 7951 commonly known as the Lever agricultural extension bill. 58 p. [Washington, Govt. print. off., 1913].

Hearings held Sept. 23, 1913, A. F. Lever, chairman; statement of Dr. B. T. Galloway, Assistant Secretary of agriculture, Hon. David F. Houston, Secretary of agriculture, Mr. A. E. Holder representing the American federation of labor, Dr. W. O. Thompson, President Ohio state university, Mr. E. H. Jenkins, Director Connecticut agricultural experiment station; text of original bill, Lever (50), with proposed modifications and an analysis thereof in parallel columns (p. 24-30); tentative suggestions agreed to by the Executive committee of the Association of American agricultural colleges and experiment stations after consultation with the Secretary of agriculture and correspondence relating thereto (p. 31-32).

(56) U. S.—*Congress—House—Committee on agriculture.* Cooperative agricultural extension work....Report Dec. 8, 1913, to accompany H. R. 7951. 13 p. [Washington, Govt. print. off., 1913]. (U. S. 62d. Cong., 2d. Sess., House of Representatives Report 110).

Submitted by Mr. Lever.

(57) U. S.—*Congress—Senate—Committee on agriculture and forestry.* Cooperative agricultural extension work, Jan. 26, 1914....Report to accompany H. R. 7951. 1 p. Washington, Govt. print. off., 1913. (U. S. 63d. Cong., 2d. Sess., Senate Report 175).

Submitted by Mr. Smith.

(58) U. S.—*Congress—Conference committee.* Cooperative agricultural extension work, April 28, 1914 ... Conference report to accompany H. R., 7951 [U. S. 63d. Cong., 2d. Sess.] 4 p. [Washington, Govt. print. off., 1914].

(59) Davenport, Eugene. The relations between the federal department of agriculture and the agricultural colleges and experiment stations [and discussion by the association]. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas. 27 (1913) p. 121-143).

Read Nov. 14, 1913; discusses Lever (54).

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H. R. 9841, U. S. 63d. Cong., 2d Sess., Dec. 4, 1913.

(60) Tribble, S. J. A bill to provide for cooperative extension work between the agricultural colleges in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto and the United States department of agriculture. 7 p. [Washington, Govt. print. off., 1913].

Introduced by Mr. Tribble of Georgia, referred to the Committee on agriculture Dec. 4, 1913.

A modification of Smith (52).

H. R. 10393, U. S. 63d Cong., 2d. Sess., Dec. 12, 1913.

(61) Adair, J. A. M. A bill to establish agricultural-extension departments in connection with agricultural colleges in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 7 p. [Washington, Govt. print. off., 1913].

Introduced by Mr. Adair of Indiana, referred to the Committee on agriculture Dec. 12, 1913.

[Smith-Lever agricultural extension act]. May 8, 1914.

(62) U. S.—*Congress.* An act to provide for agricultural extension work between the agricultural colleges in the several states receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplementary thereto. 3 p. [Washington, Govt. print. off., 1914]. (Public No. 95, 63d. Congress, H. R. 7951; *also in* U. S.—Congress. Statutes at large. 38 (1913-15) p. 372-375).

(63) Houston, D. F. Address of Welcome. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas., 28 (1914) p. 29-23).

Delivered Nov. 11, 1914; includes remarks on the operation of the Smith-Lever act.

(64) Association of American agricultural colleges and experiment stations. The administration of the Smith-Lever extension act. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas , 28 (1914) p. 111-129).

Addresses by Dr. W. O. Thompson representing the Executive committee of the association, Dr. A. C. True, representing the U. S. Department of agriculture, and Dr. C. F. Curtiss of Iowa, Dr. A. M. Soule of Georgia, Dr. A. D. Wilson of Minnesota and Dr. B. I. Wheeler of California representing the agricultural colleges and experiment stations; delivered Nov. 12, 1914.

(65) Association of American agricultural colleges and experiment stations. Report of a special committee to study types of extension organization and policy in the land-grant colleges. (Proc. Assoc. Amer. Agr. Colleges and Exper. Stas., 28 (1914) p. 260-262).

Read Nov. 12, 1914; Dr. T. R. Bryant, chairman.

(66) U. S.—*Department of agriculture—Office of experiment stations* [Editorial on the Smith-Lever act]. (Exper. Sta. Record, 30 (1914) no. 7 601-609).

On motion, the report of the bibliographer was received.

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The report of the committee on instruction in agriculture was submitted by A. C. True of Washington, D. C., chairman, as follows:

Report of the Committee on Instruction in Agriculture[1]

College courses for the preparation of extension workers

Introduction

This report of the committee on instruction in agriculture deals with college courses for the preparation of extension workers in agriculture. The data upon which the study is based were collected mainly by correspondence with presidents or deans of agricultural colleges, directors of extension work, and professors of agricultural education in these institutions, members of the States Relations Committee and other officials of the Federal Department of Agriculture who are responsible for such extension work, state and district agents and leaders in charge of agricultural extension work, a few county farm bureau agents or managers who were asked by their leaders to send suggestions to the committee, officials in charge of farmers' institutes, and a few others whose connection with extension education in some form gives them good opportunity to form opinions on some of the questions raised in this inquiry. The work of collecting and summarizing the data was performed by Mr. D. J. Crosby, as secretary of the committee, who has also aided the committee in the formulation of its conclusions.

Over 300 questionnairies were sent out from the Office of Experiment Stations and 101 replies were received. Some of the questions and many of the replies were of such a nature as to render of little value any attempt at their systematic tabulation, but many excellent suggestions were made, and these the committee will attempt to incorporate in this report, taking them up under the same headings and in the order in which the questions appeared in the questionnaire.

First, however, it should be stated that much interest has been taken in this investigation. Many have gone to considerable trouble to answer fully and carefully the questions asked, and in not a few cases the replies are the result of conferences, faculty meetings, or committee investigations, so that they might represent fairly the consensus of opinion of institutions rather than of individuals.

But while all were concerned as to the future supply and the qualifications of extension workers, not all were of the opinion that the agricultural colleges should be called upon to make any special effort to train young men for agricultural extension work. Some believe that extension workers are "born not made" or "born as well as made," and that they will find their bent while taking the college course or afterwards without any effort at direction or suggestion on the part of the college. Others fear that the offering of undergraduate courses or groups for extension workers will encourage many young men to take up such courses, who are constitutionally unfit for extension work. Some of the opinions relating to the general subject under consideration are expressed well in the following quotations:

Dean Davenport of Illinois, writes—

"You will see that we do not believe very much in a highly specialized training of extension men, but rather that the first requisite for the extension man is a knowledge of his subject, which knowledge is not different or differ-

[1] Eighteenth Report.

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ently acquired from that of the other students in agriculture. To be sure, as in a case of training for teachers, there are certain courses of instruction which he may well take, and these courses we propose to offer to that group of students who are fitting themselves for extension service. However, we are united in believing that the proposition to set out in advance to train people for this work by a four years' course particularly designed for the purpose is fundamentally wrong, partly because it takes half the college course for a man to find himself and discover exactly what he wants to do, and partly because extension men are born as well as made."

The personal factor is emphasized also by Dean Waldron of North Dakota—

"It is hard to set up any arbitrary educational requirements for a county agent for the reason that the personal factor enters so largely into his work that preparation alone, of whatever kind, would not necessarily make him an efficient agent. Generally speaking, one would think of a qualified agent as having completed a course in an agricultural college and, either during this time or after, acquiring experience in farm management by actual residence for a season upon a selected farm where he is to act, theoretically at least, as farm manager. In addition to such training one can readily see that special instruction in rural economics, particularly that covering marketing, distribution, etc., would add greatly to an agent's effectiveness. He should be able to get all of the technical education that he required in a well constructed agricultural course, but the general things that I have mentioned can only be obtained in connection with direct farm experience.

"A man who understands the farmer's problems in his own community and is sufficiently in touch with the sources of information to take care of new questions as they arise and whose personality enables him to win the confidence of the farmers, is a good county agent. I do not think it would be wise to establish any artificial barriers that would exclude men of this kind. Where the personal factor does not enter, as in the case of an experiment station worker, it is an easy matter to set up requirements that must be complied with before the man can do his work effectively. In the case of the county agent, however, where he can obtain his information readily from a great variety of sources and where his personality counts for so much, I cannot see that we would gain anything by trying to establish anything approaching hard and fast requirements."

A warning against set courses of study and a narrow education is sounded by President Widtsoe of Utah—

"I do not believe in set courses of study, except as certain groups of knowledge must be considered. The extension worker needs special knowledge pertaining to agriculture, and a broad general education besides. He should be generous, sympathetic, full of common sense, forgetful of self, and able to use his knowledge in the ordinary affairs of life. A narrow, set education will not so develop a man."

Dean Iddings of Idaho emphasizes the group plan of electives and also a plan for insuring broad general training—

"In my judgment a great deal of farm experience should be had by those who expect to go into the extension field. A student before graduating from an agricultural college with the idea of going into extension work should have had not less than two and probably as much as five or more years of farm experience.

"We are coming to the plan here of requiring that all students in the college of agriculture take the same course during the freshman and sophomore

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years. In these two years an introductory or foundational course is given in each of the various divisions of agricultural science, such as farm crops, animal husbandry, etc. We feel that a reasonable amount of work should be done in each of the foundational sciences, such as chemistry, botany and zoology, and that in addition the student must have had some work in all the various lines of what might be called the most practical phases of agricultural work. For men who expect to become instructors in technical schools and experiment station workers specialization should be encouraged, but for men who expect to become instructors in secondary schools and who plan to enter the extension field, specialization is not so desirable and probably in most cases inadvisable. We have introduced here in the junior and senior years 18 to 20 elective credits in the various degree courses of the agricultural college * * * The man who plans to go into the extension field can utilize these extra credits as well as direct his entire course, by choice of major subjects in agriculture so as to be prepared to enter the extension field. This, together with the farm experience heretofore mentioned, would so prepare a man that he might look toward field work of any sort and especially county agent work. I question very much whether the man who plans to go into extension work should make it a special point to secure an advanced degree. I think that the time that ordinarily would be devoted to obtaining an advanced degree should be applied in such a way that more farm experience and work of a practical nature might be had."

President Waters of Kansas emphasizes the same points as to broad general training and thorough preparation in the fundamentals of science and agriculture, and adds—

"The college graduate of usual age and farm experience needs to take charge of, or be an employee on, a successfully managed farm rather than to pursue graduate work in a college or university. After two or three years of successful farm experience, in which he comes in contact with the business side of farming and is responsible for making the farm pay, he may with great profit to himself, in preparing for extension work, go to the college again for a year. His college work, however, should be more in the nature of rounding out his education along the line of his particular work in the extension field and should be of such character as to give him a better grasp of the principles underlying the practices which he undertakes to teach. Therefore, no general course could be laid down which would be suitable for all the lines of extension work. It is important that the graduate work be taken in an institution other than his Alma Mater and it is not necessary that the institution be in the same region as is his Alma Mater.

"If the county agent work is to be successful, it must be placed in charge of men who know more about farm practices and farm business than do the men whom the agent is serving. It is impossible to get this knowledge from a college course. It must be based on a college course but can only be obtained on a farm. I feel that I cannot too strongly urge the importance of successful farm experience added to a broad, sane college course."

State Leader D. W. Frear of Colorado thinks that a graduate course for extension workers should not differ much from that offered in other lines. He adds—

"However, before the degree is granted to a graduate student in this work, I think he should have had considerable experience along some line of extension work, either as a county agent, as a special lecturer, as a state leader of club work or county agent work, or along some other line which would indicate that he had some special ability. I do not believe that college grad-

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uates possessing only bachelor's degrees should be encouraged to take such a course with the expectation that simply taking the course would fit them for any kind of extension work. If we are not careful we shall overdo the thing and encourage people to enter upon extension work who are not prepared fundamentally for the work."

A summary of the replies to questions sent out by the committee follows:

SUMMARY OF REPLIES TO QUESTIONS

I. Entrance requirements—

1. Should anything be added to existing entrance requirements, e. g., farm experience?

Sixty-eight of those who answered this question were in favor of making farm experience a prerequisite to graduation for extension workers, and 60 of them would insist upon it as an entrance requirement. Of the remaining eight who answered the question negatively, several would like to see farm practice made an entrance requirement, not only for prospective extension workers but also for all students entering the agricultural courses. But since they were in favor of treating all entrance students alike, and they are not prepared to make farm practice a general entrance requirement, they gave a negative reply.

One correspondent mentioned a high-school course in agriculture as a desirable prerequisite for those entering college to prepare for extension work.

2. What should be the farm experience prerequisite?

From the nature of the replies to this question it was evident that many did not consider its relation to the previous question, and so they mentioned the farm experience which an extension worker should have, rather than the farm experience needed to enter upon a course of training for extension work. Nevertheless, it was quite evident that nearly all who answered this question—and there were over 80 replies to it—believe that a rather rigid farm experience prerequisite should be insisted upon. There were only two who would waive the requirement, three others who would make it the same as for other agricultural students, which would in most cases mean six months or less, and five others who would admit on less than a year's experience. Thirty mentioned a one-year requirement and seven of these specified "one full calendar year." Ten favored two years; four, three years; two, four years; two, five years; and 14 would like to insist that the applicant be farm reared. Eleven specified that applicants for admission should have enough experience to acquire familiarity with ordinary farm operations.

Familiarity with ordinary farm operations is doubtless the qualification that all have in mind as the desirable minimum for agricultural college entrance. Certainly not much experience in the actual management of farm operations could be expected of young men who enter college at 16 or 18 years of age. Those who are older and more experienced are the exceptional men who might be put into responsible positions in agricultural extension immediately after graduation, without postgraduate experience.

II. Undergraduate courses—

1. Required college courses—

a. To what extent should the studies of each year be definitely prescribed?

As in the case of entrance requirements several correspondents would make no distinction between students intending to take up agricultural

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extension work and those preparing for other agricultural work. Very few could be said to favor absolutely unrestricted electives. Not more than three were in favor of less than two years of prescribed work, while 10 expressed themselves as in favor of prescribing nearly all of the undergraduate work. Fifteen were in favor of prescribing all of the work of the first two years and 15 would prescribe freshman and sophomore work and about half of the remainder of the course. Four believed in prescribing at least a foundation course in each branch of agriculture.

The general attitude toward prescribed courses manifested by those discussing this question can be judged from the fact that about 80 percent of them were in favor of prescribing at least half of the undergraduate courses.

b. Should minimum fundamental courses in each of the related sciences and each branch of agriculture be insisted upon, or would it be better to devote more time to a few subjects?

There was no doubt as to the prevailing opinion on this question. Out of 79 answers 74 were in favor of prescribing minimum fundamental courses.

c. Should specialization in some phase of agriculture be encouraged?

On this question the replies were about three to one for specialization. Some cautioned against "over specialization" and some would not encourage students in an extension course to specialize more than other students, but there seemed to be a quite general feeling that a young man would stand a better chance of succeeding in extension work if to a broad general course in agriculture he were to add more thorough preparation in some one phase of agriculture.

By some correspondents a distinction was made between those preparing for a position as county agent and those who wish to become specialists. By these it was held that prospective specialists might be permitted considerable specialization, even in undergraduate work, but that prospective county agents should follow either a prescribed course or specialize only in a broad way by means of elective groups.

Still others would avoid all specialization in the undergraduate course, but would insist upon post-graduate specialization as an essential to recommendation for any responsible position in extension work, not on the ground that post-graduate work is essential to success in extension work, but because a college which assumes the responsibility of preparing and recommending young men for the extension field should set unimpeachable standards.

d. Should there be any difference between the required work of those preparing to become specialists and those preparing to become county agents? If so, what?

Sixty-four of the 74 correspondents answering this question replied in the affirmative, and 47 of these stated that the work of prospective county agents should be broader and more general than that for specialists. Among several subjects specifically mentioned as desirable for the prospective county agent to take as a part of his undergraduate course, rural economics was mentioned 15 times, farm management 14 times, rural sociology 13 times, extension organization and policy and psychology each eight times, extension laws seven times, public speaking twice, and farm accounting, organization, and extension teaching each once. Others spoke in a general way of the desirability of such students pursuing courses "dealing with rural problems".

For the prospective county agent, then, there seems to be quite general agreement that not less than two of the four years of undergraduate work should be prescribed, that the prescribed work should include fundamental courses in the sciences related to agriculture and in the several branches of

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agriculture, that moderate specialization should be provided for, and that subjects dealing with rural, social, and economic problems should not be omitted.

For the prospective specialist in extension work, on the other hand, there seems to be the feeling that the present arrangement of agricultural courses is fairly satisfactory, that he should become first a specialist in animal husbandry, agronomy, farm management, entomology, or some other branch of rural science, and then, if he has the inclination and the ability, he may take up extension work in his chosen line. This feeling is strengthened, no doubt, by the fact that the demand for specialists in extension work is not now so pressing as for county agents.

2. Elective college courses—

a. To what extent should elective courses be made available?

On the question of electives for prospective extension workers there seems to be nothing approaching unanimity of opinion, except that electives should be largely confined to junior and senior years. Twenty correspondents specified from 50 percent in junior and senior years to 75 percent or "nearly all" in these years, but 20 others would make electives available only to a very small extent. Fourteen others would offer no free electives, but would arrange for elective groups in junior and senior years, while three suggested senior electives and junior extras for students in professional extension courses. Three correspondents would put all agricultural students on the same basis as regards elective courses, and eleven, mostly representing detached agricultural colleges in which facilities for offering electives are comparatively limited, would make electives available "as far as possible". However, statements indicating a leaning toward a large proportion of elective studies often are conditioned upon provision being made first for fundamental courses in science and in technical subjects, or, in other cases, upon making a distinction between electives for those preparing to be specialists and those preparing for county agent work, so as to give the former larger freedom in the matter of electives. The feeling seems to be rooted strongly that if the prospective county agent completes the desirable fundamental courses there will be little opportunity, in the ordinary four-year curriculum, for elective subjects, unless, as some have suggested, he takes them as "extras".

b. Should electives (or required subjects) not now generally available be added to the list, e. g., courses in educational psychology, rural education, rural economics, rural social conditions, extension teaching, extension organization and policy?

Eighty correspondents answered this question and the proportion was 39 to 1 in favor of one or more (mostly more) of these subjects, either as required or elective work. As was indicated in discussing the relationship between the required work for specialists and that for prospective county agents, there is a strong feeling that training in economic and social science is essential for those whose work primarily is among practical people out upon the farms and who have passed school age. As one correspondent wrote:

"The training is likely to be too special in the field of production. The county agent is first of all a rural leader and must understand other problems incident to rural industry besides production."

Another believes that:

"The student candidate for county agent * * * should be offered some subject or subjects that will develop his tact, diplomacy and ability to meet and measure people."

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Still others would add to the list of subjects mentioned above such subjects as markets and marketing, agricultural journalism, and "public speaking and presentation of subject matter."

As to the value of these subjects to the extension worker there seems to be little question in the case of social and economic studies or of studies dealing with extension organization, methods and policy; but in various quarters some question is raised as to the wisdom of burdening students, who are likely to have a very full curriculum, with such a subject as educational psychology. But, it is pointed out, practically all specialists in extension work become teachers in extension schools, and even county agents are called upon frequently to teach in some capacity or other. Besides, a knowledge of the principles of educational psychology will help one to understand the workings of the human mind and to this extent will help to develop his "ability to meet and measure people". Furthermore, courses in rural economics and sociology already are available in many of the agricultural colleges and, as one correspondent pointed out, if there is danger of overloading the curriculum, the essentials of all these courses could be given in one or two courses.

Courses dealing with extension organization, methods and policy are yet to be developed, except that in a few isolated cases some of the features of extension work as it is now being carried on are being taught or have recently been offered separately or in connection with other courses. For example, the New York State College of Agriculture, which was probably the first institution in this country to offer such courses, gives three courses in "extension work", the first two of which are two-hour courses and the third a one-hour course. The work consists of lectures and discussions on problems of agricultural extension and is designed to acquaint students with parliamentary practice, to encourage interest in public affairs, and to train for effective self-expression in public.

Another closely related course in this institution is that in "rural organization", which is a one-hour course dealing with rural community organization as exemplified in farm bureaus.

The Nebraska College of Agriculture is offering for the first time a course in "extension methods", open only to juniors and seniors, with one or two hours credit. This is a study of agricultural extension organization and work and of the presentation of agricultural and home economics subjects by extension methods. Training will be given in the preparation and use of subject matter for extension instruction, with special emphasis upon the value, preparation and use of illustrative and demonstrational material.

A similar course is that offered this year at the Agricultural and Mechanical College of Texas in "agricultural extension and demonstration". This deals with the history of the extension and demonstration movement in agriculture, types of organization for extension work, the most effective methods employed in extension work, and problems and practice in presenting subject matter to varied audiences.

The College of Agriculture of the University of Wisconsin at its summer session this year conducted a course in "agricultural extension methods and problems", consisting of 27 lectures, about half of which were given by the assistant director of agricultural extension and the remainder by other members of the faculty, by the extension agents of transportation companies and other industrial and financial corporations interested in agricultural production, and by representatives of the United States Department of Agriculture. (See pages 65-66.)

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III. Graduate courses—

Should graduates of the four-year agricultural college course be recommended for extension work of any kind? Discuss exceptions which may be made in this connection. If graduate work or practice should be insisted upon, please discuss the following items fully:

1. Resident graduate work—

a. Should it be done in the institution in which the bachelor's degree was earned or elsewhere?

b. What should be its character and what kind should it cover?

In the first place there was serious question in the minds of some correspondents as to whether prospective county agents would be prepared better for their work by pursuing graduate studies and work. Specialists in extension work would be better prepared—that was generally conceded; but county agents and extension workers in general agriculture, those who conduct demonstrations and deal with very elementary principles in agriculture—might they not become so highly trained technically as to put them out of sympathy with the slow-working processes of the farmer's mind—the less successful, plodding farmer whom we fail to reach with the bulletin, the farmers' institute, and the extension school? In a few cases it was pointed out that some of the most successful county agents were men of meager technical training in agriculture, some of whom never had attended an agricultural college. On the other hand, some of the best trained graduates of agricultural colleges had failed miserably as county agents. Would it not be better to pick men rather than to train men?

The secretary of the committee has interviewed some of the very successful county agents who are not graduates of agricultural colleges and has letters from others of this type. Practically without exception these men deplore the fact that they lack technical training. They believe they could succeed much better with technical training. As a matter of fact these men and others like them may have succeeded because in them we find developed to a high degree the qualities of sympathy, leadership, and resourcefulness. They see other men's problems and bring expert assistance to their aid in solving them. They are not successful because of their lack of technical training, but in spite of it. Many of them, too, are men who have had exceptional opportunities or experience in dealing with men or have made notable success in practical agriculture. They are men who have read and studied to educate themselves.

That these qualities, experiences, and opportunities are highly considered by those concerned with the training or the employment of county agents, is indicated by the replies to the question whether agricultural college graduates, without further training or experience, might be recommended for extension work of any kind. Only nine of the 71 correspondents replying to this question gave an unqualified answer in the affirmative, and nine an unqualified negative. The other 43 said that they might be recommended if exceptionally mature, or if they had had exceptional farm experience or teaching experience, or were possessed of exceptional qualities of leadership, and so forth. Otherwise it would be better for them to get experience or additional training.[1]

The point was made also that, just at present, when the pressure for men is so great, we cannot insist upon such high qualities as we shall demand later on when men of the desired training and experience become more plentiful.

[1]See report of New York Committee on Eligible List of Candidates for Farm Bureau Managerships, page 29.

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As to whether graduate work should be done in the institution in which the bachelor's degree was earned or elsewhere, 83 percent of the replies were in favor of going elsewhere, provided the student could find suitable conditions in another college, and only 8 percent favored graduate work in the same college. The remainder pointed out the advantage, for prospective county agents, of pursuing graduate work in the state in which the candidate expects to work. One correspondent discussing the question from this point of view says:

"This depends largely on the probable field of work to which the candidate goes. The graduate course had best be taken in the state where work is desired. Special state problems can then be taken up as research work, and the candidate fitted to meet and solve these. If the candidate has no choice of state or territory, his graduate work should be done in a different university than his undergraduate work. In this way he gets a greater width of vision and a different angle of attack for similar problems."

One difficulty encountered in following out this plan is pointed out by another correspondent, who calls attention to the fact that some of the agricultural colleges are not in a position to offer suitable graduate work for extension candidates.

Relative to the character of graduate work for prospective extension workers, there is considerable diversity of opinion. That the work of prospective county agents and that of specialists should differ materially is quite generally recognized, and yet a goodly number of the correspondents, especially among directors of extension work, would make no distinction, so far as regulations are concerned, between graduate work for prospective extension workers and that for other graduates.

A considerable number of correspondents expressed themselves in favor of students doing graduate work along the line of their chosen major subject in undergraduate work or their chosen major in extension work. What is meant by this is not clear, unless it be that the graduate work should be intensified along a few lines.

As between regular graduate study, graduate practice and a combination of the two, correspondents were about equally divided. Some were in favor of regular graduate work; some, of graduate work consisting largely of practice in the field or in extension activities; and some, of a judicious combination of the two kinds. Several called attention to the difference between the needs of the county agent and those of the specialist, maintaining that the former should emphasize practical work and the latter intensive study or investigation. One specific suggestion was to the effect that the graduate work of the county agent should consist mainly of "the theory and practice of demonstration", and another that the graduate student should work in an experiment station long enough to be able to outline and conduct a demonstration "which would demonstrate something". Another suggestion along this line is to the effect that the graduate work include a study of "station and extension work of his own and all other stations and colleges in his chosen field of extension effort."

With an appreciation, doubtless, of the inadequacy of present undergraduate courses in economic and social sciences, for those intending to be leaders and advisors among rural people, several have suggested that their graduate work consist largely of such subjects as rural economics, farm management, rural sociology and psychology. Others would disassociate graduate work and practice, the idea being to have the students take a year of practice and then a year of graduate work. One correspondent who thinks

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that the graduate work should consist largely of economics and sociology writes that "actual extension work should go between undergraduate and graduate work", and another that one year of post-graduate work, as practical as possible, "should be followed by summer courses each year, when practicable."

Opinions as to the time which an extension candidate should devote to graduate work did not differ very materially. There were 32 who favored one year, 12 who favored two years, and one who mentioned a longer period, but most of those who mentioned a longer period than one year had in mind a combination of practice and study. One year of resident graduate work is the generally accepted standard of time, and there seemed to be no inclination to change this. However, when it came to a discussion of the time a young man should devote to acquiring experience in farming and in extension work before being recommended for a position of responsibility as county agent, opinions differed considerably.

2. Experience—

a. Should farm experience or practice in extension work be insisted upon after the completion of the college course and should it be counted toward an advanced degree?

Upon the first of these two questions there was practically no difference of opinion. Two replied in the negative, while 68 said that experience should be insisted upon after the college course and 10 more insisted upon it then, if not before.

As to whether credit toward an advanced degree should be given for practice, opinions differed considerably, but those who favored such credit outnumbered those who did not two to one. The arguments advanced for and against giving credit for experience can be indicated best by quotations from some of the letters received.

The following excerpts represent the point of view of those who opposed the proposition:

"Farm experience should be required after the completion of the college course if there has been no experience prior to entrance. Farm experience should not be counted toward an advanced degree, as it possesses none of the academic elements applied in a degree which represents learning or scholarship."

"In most cases it should be required. It should not count, however, toward a degree until the work can be systematized more than it is at the present and carried on under some responsible person."

" * * * unless it has resulted in some concrete studies that can be published, it should not count towards an advanced degree."

Among the expressions in favor of credit for extension practice or advanced farm practice, the following are fairly representative:

"We believe that both farm experience and preliminary practice in extension work should be regarded as a necessary prerequisite to permanently filling a responsible position in extension work. This experience being very necessary should, we believe, count to a reasonable extent toward an advanced degree, which degree should be recognized as different from the degree granted purely on the basis of the accomplishment of resident study in an institution without regard to practical experience."

"Farm experience desirable. Some types might be counted as laboratory work for advanced degrees."

"It might well be credited toward a degree, but a surplus of men will have to appear before this plan will work out."

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"Credit should be given for definite extension projects."

"Credit, yes, provided such work is done under supervision and reports are made."

"If experience is gained under proper supervision, credit should be given for it."

"Farm experience should be insisted upon and should be counted toward an advanced degree, if an advanced degree is to be required for extension positions."

"If followed up by a thesis or special report, possibly an examination, credit should be given."

"Actual experience is of so much importance in this work that it should be counted toward an advanced degree."

b. Should experience be acquired under supervision of the college?

Fifty voted in favor of college supervision and 20 against. Many consider supervision desirable but doubt whether it is practicable; others do not believe in it at all Some who say that the graduates should shift for themselves, and should have no supervision of their post-graduate practice, do not seem to take into consideration the fact that the matter under consideration is college preparation of extension workers, not the employment of extension workers. It may be the best thing for some young men—college graduates—to shift for themselves, but before a college can recommend them for responsible positions it must have some way of measuring their attainments; and this can be done only by supervision or examination of some sort. As several correspondents have pointed out, if farm practice or other practical experience is to count toward a degree it should be supervised by the college. If no credit is to be given, supervision is unnecessary.

Some make a distinction between "supervision" and "observation", maintaining that if supervision is impracticable, then experience should be acquired in the employ of some thoroughly practical and successful farmer or as apprentice to some successful county agent "approved by the college". But whatever the term used, it seems to be the idea that the post-graduate experience should be thoroughly practical, that it should be along the line of extension work which the candidate expects to follow, and that it should be measurable by scholastic standards, or something closely resembling them, if credit toward a degree is to be given.

c. What kinds of experience should an extension candidate have and what should be the relative amount of each?

That all should have farm experience seems to be agreed, and extension experience is also frequently mentioned as desirable, as is also "work of a practical nature" without further specification. Among other kinds of experience mentioned are teaching experience, actual experience in the line that the student intends to follow, experience in social work, in "handling men", in "dealing with people", in "public affairs" and in public speaking.

d. In what specific ways may desirable experience be acquired?

Some of the ways that were mentioned and the number of persons suggesting each are as follows: Working on farms 38, apprenticeship to successful extension worker 34, in charge of some farm project 24, doing extension work 21, teaching 19, selling farm machinery or engaging in other commercial work 14, and experiment station work 6.

Farm work of some kind usually was the first thing suggested and in many cases it was specified that the farm work should place the responsibility of management upon the student, that he should manage the home farm or some other farm for a year or two, with full responsibility for all

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details of the work. Experience of this kind, it was thought, would enable him to appreciate and help him to solve the difficulties of other farmers.

Apprenticeship to other extension workers at a small salary, usually just about enough to cover expenses for clothing and subsistence, is a plan which already is being tried in a number of states, though not as a part of a college professional course for extension workers. As a sort of final test of the candidate before giving him full responsibility, it has much to recommend it.

Those who suggest "doing extension work" doubtless had the same thing in mind, for it is rather unusual to place a young man as county agent until he has shown ability in some line of extension work or in teaching.

The suggestion that desirable experience could be gained by teaching probably was prompted by the fact that many of the successful extension workers have been drawn from the teaching profession, and also from the fact that many of the teachers of agriculture in high schools engage more or less in extension work and so get real experience in the extension field. The fact that nearly every state that gives state aid for vocational agriculture in high schools now requires the teachers of agriculture to supervise the home projects in agriculture of the students, makes employers of extension workers turn to the vocational agricultural schools as valuable training schools, especially for county agents.

Employment in an experiment station or in other research work is mentioned as one way to familiarize prospective extension workers with the progress of scientific agriculture and also to insure an appreciation of all the factors that go to make up a demonstration. As one correspondent put it, the candidate should "do enough investigational work to be able to outline and carry out a real demonstration." As a matter of fact, however, their scientific training in college should give them a clear idea of the essentials of a demonstration.

The other suggestions—that the candidate engage in some commercial enterprise, in social work, in organizing rural communities, or in the management of a cooperative enterprise—are closely related and arises from a belief that ability to meet and deal with people and lead them are prerequisites to success in helping them.

e. By what system of supervision and reports may the preparedness of a graduate student be determined?

Relatively few of our correspondents had definite suggestions to make in reply to this question. The question was a new one. There was no experience to guide and apparently little thought had been given to the matter prior to the sending out of our questionnaire. Consequently, many of the replies suggested only the tests which have been in use a long time in connection with scholastic post-graduate studies, such as the examination of students and the preparation of a thesis. On the other hand, some of the replies contained, in addition, some very pertinent suggestions indicating consideration on the part of the correspondents of the practice features of graduate work for prospective extension workers.

The suggestion most frequently made was that a system of reports be perfected to determine the progress and success of the students, these reports to be submitted at stated intervals by the students, or by their employers or instructors, or by both.

Another suggestion made by a number of correspondents was to the effect that a regular system of supervision be provided for through the appointment of a supervisor or inspector of practice, who would have charge of all the practice work of these graduate students, on farms, in extension schools, in

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farm bureau work, juvenile club work, farm management surveys, etc., and would visit them frequently to check up results, and give them needed help and encouragement. A somewhat similar plan must have been in the minds of others who suggested "inspection" of the work of the graduate students, because any system of inspection would involve the employment of a field man to have charge of the work. The suggestions concerning supervision and inspection were more numerous than any of the others, but there was another considerable group who would determine the preparedness of graduate students by "the success of the work they have been doing". How their success was to be measured was not stated, but evidently some system of supervision or inspection would have to be organized for the purpose.

f. What form of credit should be given to a student who has completed a professional extension course comprising one or more years of postgraduate study and experience? Should a special degree or certificate be conferred?

All but five of the correspondents replying to this question were in favor of some form of credit, not only the usual bachelor's degree for undergraduate work, but also some additional credit for properly organized and supervised postgraduate practice. That the usual credit would be given for scholastic postgraduate work done in this connection goes without saying, but what rating should be given to the practice features of a professional course for extension workers and whether the usual master's degree or some special degree should be conferred are matters yet to be determined.

As between granting the usual master's degree and a special degree, opinions were about equally divided. Twenty-eight were in favor of the usual degree, 28 in favor of a special degree, and 14 in favor of a certificate. The following quotations from replies give fairly well the point of view of those favoring the usual master's degree:

"The course should be broad enough to be coordinate with other courses and should receive the same credit and degree."

"He should receive the same degree as any other graduate student. I doubt if it is wise to grant any special degree or certificate. It would probably result in loading extension departments with a lot of second rate men."

"If such a course represents, as it should, real work and systematized knowledge, no special degree is necessary".

"Post-graduate study for extension service should be rated as highly in conferring advanced degrees as postgraduate study in other respects. There is no value in a special degree beyond the value of the college degree of equal rank."

"If he has earned a regular degree, grant it; if he has earned a job, he'll get it."

The next two quotations are arguments for a degree or other recognized credit rather than for any particular form of credit.

"If the work measures up to its full possibilities, there is no reason why an advanced degree should not be granted. In case this is not apparent, a certificate of proficiency might be issued. Some of the most successful graduate students who have served many years at the head of departments in colleges, have gained their graduate degrees through the accomplishment of results in actual practice rather than by scholarship attainments. On the other hand, we have numerous examples of advanced degrees awarded on the basis of scholarship which mean very little in measuring the ability of men to get results."

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"An advanced degree or a special degree would be an added incentive to standard preparation and an assurance of competency." This writer believes that the degree would not be "an assurance of competency" unless the work done for the degree, or a part of it, consisted of actual practice in the extension field.

The next quotation is from one who believes that because practice in extension work is very necessary it—

" * * * should count to a reasonable extent toward an advanced degree which should be recognized as different from the degree granted purely on the accomplishment of resident study in an institution without regard to practical experience." He says further—

"We believe that a certificate and not a degree should be granted for one year's graduate experience and study; further, that a degree should not be granted on the basis of less than two years of combined study and experience, which study during the two years should approximate one year of resident study in a good institution." Such a plan, if fully carried out, would mean the completion by the graduate student of all the work required for the usual master's degree, and in addition to that a year's practice in his chosen field.

Suggestions as to the special degrees which might be conferred upon the completion of a professional extension course have been received from a number of sources and include the following: Master of Extension Service, Master of Agricultural Extension, Master in Extension, Master of Science in Agricultural Extension, Master of Demonstration and Extension. There was one suggestion for the doctorate—that for two years of postgraduate work and not less than one year, preferably two, of successful field experience in extension work, the degree of Doctor of Agricultural Extension be conferred.

Each of these suggestions possesses more or less merit, but it would be well to keep in mind that degrees usually are indicated by the initials of the principal words in them. On this account, Master in (or of) Extension should be avoided. The initials would be M. E., which already is well recognized as standing for Mechanical Engineer. Master of Extension Service would be good, except for the fact that the word "service" is coming to stand for an organization, such as Forest Service, States Relations Service, etc. Master of Demonstration and Extension contains one superfluous word, in that extension work as we think of it includes demonstration. If we eliminate these three forms there remain two suggestions to which there would probably be very little objection. Master of (or in) Agricultural Extension is somewhat analogous to other well established special degrees, such as Master of Agriculture, Master of Horticulture, Master in Landscape Art, and the like, and Master of Science in Agricultural Extension is much like the degree Master of Science in Agriculture now conferred by several of the agricultural colleges. It would probably have one advantage over any of the other suggested forms, in that it would indicate the completion of the necessary work for a master's degree in science as well as in agricultural extension.

There is one disadvantage in all these suggested forms. They are not inclusive of home economics extension, which is a very important feature of the rural extension movement, and the training of extension workers in home economics is demanded as urgently as is that of agricultural workers. We might have such degrees as Master of Home Economics Extension or Master of Science in Home Economics Extension, or, if there is objection to a multiplicity of extension degrees, we might coin an inclusive degree,

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such as Master in Rural Extension. Whatever else is done, if special degrees are conferred they should be sufficiently inclusive as well as exclusive, and they should not be confused easily with other well established degrees.

EXTENSION COURSES NOW AVAILABLE AT SOME OF THE AGRICULTURAL COLLEGES

The last item in the questionnaire sent out by the committee was a request for an outline of a proposed undergraduate and a graduate course for the preparation of extension workers, with semester credits for each subject. Several outlines of proposed undergraduate courses were submitted, but since these outlines did not show much uniformity in the order of presentation of subjects nor in the time devoted to each subject, it is thought best not to give them in full, but to call attention to some of the salient features which they had in common. One outstanding feature of the suggestions is the relatively large proportion of required as compared with elective work in the undergraduate courses; another the opportunity given in each case for some specialization by means of agricultural electives. In every course outlined by years, some of the work of each year is made compulsory and in only one of the courses are any electives permitted in freshman or sophomore years.

A third feature of agreement is the inclusion among required subjects of fundamental courses in practically all branches of agriculture, as well as in closely related applied sciences, such as plant physiology and pathology, entomology and veterinary science. Farm crops are mentioned in each of the six courses outlined, soils and animal husbandry in five, horticulture, rural engineering, plant pathology, plant breeding, dairying, entomology, and veterinary science in four, and plant physiology and poultry in three.

The prominence given to sociological and economic subjects of rural application and to professional subjects is noteworthy, considering the recent introduction of these subjects into the agricultural college curricula. Rural economics and rural sociology are included among required undergraduate studies in five of the outlines, farm management in four, psychology in three, and economics, rural education, rural organization, and extension methods in two. Such subjects as extension teaching, public speaking, and extension organization and policy are mentioned several times and already are included in courses now offered by the New York, Nebraska and Texas colleges.

The work of collegiate grade which has been done to prepare extension workers in agriculture is exceedingly meagre and, up to the beginning of the past college year, so far as the committee has been able to learn, was limited to the courses in extension teaching and in rural organization conducted at the New York State College of Agriculture. The course in extension methods at the Nebraska college and that in agricultural extension and demonstration at the Texas college are quite similar in outline to the New York courses.

Outlines and descriptions of courses now available in some of the agricultural colleges follow:

IOWA

The department of farm management of the Iowa Agricultural College recently has announced a five-year course leading to the degree of Bachelor of Science in Farm Management. Four years are required at the college and one year in practical work away from the college, under the supervision of the department of farm management.

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"The four years of college work are outlined to give the student a strong general course in agriculture. The fifth year will be spent in practical work in the line which the student proposes to follow after graduation, as, for example, practical farm management or county agent work * * *

County agent work is in its beginning and the demand for men trained along this line is practically unlimited. With the approval of the department the student desiring to take up this work will spend his fifth year with a competent and reliable county agent. Meeting the practical problems of this work and learning the methods employed by the successful county agents will be of inestimable value in fitting graduates of this course for positions in this field."

The college offers a two-hour elective in methods of agricultural extension teaching. This study is designed to bring together in organized form the accumulated knowledge of the faculty on agricultural extension. It will plan to use the ability of various members not only of the agricultural education department but other members of the Iowa State College staff who can give valuable help directly from experience in the organization of extension work, the preparation of material, adaptation to community demands, short courses, institutes, and other topics of interest to one preparing to enter the field of agricultural extension service.

NEBRASKA

A half-year course in extension methods is offered, with one to two hours' credit. It comprises study of agricultural extension organization and work, and of the presentation of agricultural and home economics subjects by extension methods. Training is given in the preparation and use of the subject matter for extension instruction. Special emphasis is laid upon the value, preparation and use of illustrative and demonstrational material. Each hour of credit will require, in addition to the study of extension methods, the preparation, illustration and delivery before the class of a lecture on some subject to be agreed upon by student and head of department concerned.

NEW YORK

At the New York State College of Agriculture a special committee was appointed in the winter of 1915 to make recommendations concerning courses for the training of extension workers. This committee decided to limit its present studies and recommendations to courses for the preparation of young men for positions as county farm bureau agents and for other general types of extension work in agriculture with the idea of considering later the training of specialists for this field. Before making its final recommendations it had before it for consideration the report of another committee appointed to establish an eligible list of candidates for farm bureau managerships, which report set forth in the order of their estimated importance the following general qualifications for eligibility:

1. *Experience.* Preference will be given to applicants who have been reared on a farm, or who have lived on a farm for the year round not less than five years since they were 12 years of age. An applicant's farm experience should be such that he is familiar not only with the ordinary details of farm practice and knows something about farm management, but also he appreciates the farmer's point of view on rural problems. Preference will be

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given also to applicants who actually have operated a farm or who have had other business, executive, or teaching experience.

2. *Personality.* In considering the personality of an applicant, emphasis will be placed upon accuracy, alertness, initiative, facility in approaching farmers, and other qualities which make for good leadership and organizing ability. Emphasis will be placed upon this factor and upon good moral character.

3. *Technical training.* Preference will be given to applicants who have had a full four-year course in agriculture at a good agricultural college. Graduates of non-agricultural colleges, whose farm experience is not exceptionally good, will not be considered. Persons who have taken work in agricultural colleges, but who have not graduated, must have had an excellent record in their college work and also in practical work, to merit consideration.

Having in mind the farm practice qualifications recommended above, the Cornell committee on the training of extension workers agreed upon the following scheme of professional extension courses in agriculture:

Any student who is qualified to enter the college of agriculture and has had the necessary farm experience may register in a professional extension course in agriculture. The courses are intended primarily to prepare young men to engage in county farm bureau work and other general types of extension work in agriculture, but they may be pursued also to advantage by students desiring a broad general course in agriculture, with fundamental work in each branch of agriculture and not much specialization.

The professional courses require five years of college work and five years of experience or practice. They lead to the degree of Bachelor of Science at the end of four years of college work and to the degree of Master in Agricultural Extension upon the completion of the fifth year of college work and the presentation of evidence of satisfactory practice and experience.

A recommended list of studies which will fit the needs of most students desiring to engage in county farm bureau work appears on the next page. The student's schedule should be prepared under the direction of the department of extension teaching.

For those who desire to become extension workers in some special branch of agriculture it is recommended that a schedule of studies be arranged in consultation with the department in which specilization is desired.

Each student entering a course to prepare for extension work in agriculture must be farm reared up to the age of 12 years, or, not later than the beginning of his junior year, must satisfy the professor of farm practice as to his actual farm experience. Such experience will be presumed to be the equivalent of at least two years of farm work as an employee, after the age of 12 years and is to be experience covering the whole year round of farm operations, not an aggregation of summer vacation experiences.

In the first four years of the professional extension courses, students should complete, in addition to the 116 hours of required and recommended work outlined below, not less than 14 hours of elective work. This elective work should include at least 10 hours in some technical agricultural group.

Candidates for the degree of Master in Agricultural Extension shall complete one year of postgraduate work under the requirements of the Graduate School, and shall engage in the equivalent of three years of practical work satisfactory to the department of extension teaching. The practical work may consist wholly of employment as owner, manager, or superintendent of an agricultural enterprise, or it may include practice in extension work under the immediate direction of an extension worker approved by the de-

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partment of extension teaching. Whatever the type of practice offered by the student in the professional entension course, it shall be satisfactory to and approved by the department of extension teaching.

The following subjects and semester credits are included in the recommended list of studies referred to in the general statement quoted above:

Freshman Year		*Sophomore Year*	
English	8	Botany	5
Chemistry	10	Physics	5
Biology	6	Pomology	4
Geology	3	Soils	3
The Farm	2	Animal Husbandry	6
Vegetable Gardening	2	Dairy Industry	3
		Plant Physiology	4
	31		30

Junior Year		*Senior Year*	
Political Economy	6	Plant Breeding	2
Farm Crops	4	Forestry	2
Plant Pathology	7	Farm Poultry	3
Entomology	6	Rural Engineering	3
Rural Engineering.	3	Dairy Industry	2
Extension Teaching	5	Landscape Art	1
		Rural Economy and Rural	
	31	Social Conditions	3
		Farm Management	6
		Extension Teaching	1
		Rural Organization	1
		Electives	6
			30

The junior and senior courses in extension teaching and rural organization have been planned and given with special reference to the needs of extension workers. Their catalog descriptions follow:

1 and 2. *Extension Work.* Lectures and discussions on problems of university extension in agriculture. Practice in oral and written presentation of topics in agriculture, with criticism and individual appointments on the technique of public speech. Designed to acquaint students with parliamentary practice, to encourage interest in public affairs, and to train for effective self-expression in public. Special training will be given to competitors for the Eastman prize for public speaking. A few juniors and seniors will be sent out into the state to address meetings.

3. *Extension Work, Advanced Course.* The course will take up advanced study of extension problems and parliamentary law. Students will be given opportunity to gain experience in addressing meetings whenever it can be arranged. The number of students will be limited.

Rural organization. Open only to seniors. A study of rural community organization as exemplified in farm bureaus, designed to familiarize students with this movement. A county problem will be assigned.

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The following outline of the 13 lectures constituting this course will be of interest:

1. The Relation of the Farm Bureau to Agricultural Education and Development.
    a. The agricultural college teaching
    b. The experiment station investigation
    c. The extension field
        (1) Farmers' institutes
        (2) Extension schools
        (3) Boys' and girls' club work
        (4) Correspondence courses
        (5) The farm bureau
2. History of the Farm Bureau Movement.
    a. In Canada
    b. In the South (Dr. Knapp's work)
    c. In the North
    d. In New York State
3. The Financing of Farm Bureaus.
    a. Federal support
        (1) Present conditions
        (2) The Smith-Lever Act
    b. State support
        The New York law
    c. County support
    d. Private contributions
        (1) Council of grain exchanges
        (2) Railroads
        (3) Chambers of commerce
        (4) Miscellaneous
    e. Membership
4. The Functions of Farm Bureau Agents and their Relative Importance.
    a. Rural leadership in local agricultural affairs.
    b. Organization of community interests
    c. Studying local economic conditions
    d. Demonstration
    e. Advice and information
5. The Cooperative Principle in Farm Bureau Work.
    a. Fundamentals
    b. Their application in practice
    c. Working plans
        (1) Constitution and by-laws
        (2) Factors to be avoided
6. Studying the Problems in a County.
    a. History of the county
    b. Observation of practice management
    c. By the farm survey method
    d. By local experiment
7. Local Rural Leadership.
    a. The need
    b. The man (qualifications).
    c. The purpose
    d. The result

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8. Local Community Organization.
   a. Material—from the production standpoint
      (1) For breeding crops and animals
      (2) For cow testing
      (3) For farm or crop practice improvement
   b. Commercial—from the marketing standpoint
      (1) For the purpose of supplies
      (2) For the sale of products
      (3) For securing better markets and market information
   c. Social
      (1) School
      (2) Church
      (3) Roads
      (4) Miscellaneous
9. The County Farm Bureau Agent as an Experimenter and Demonstrator.
   a. The discovery of local facts
   b. The local application of general facts
   c. The farm practice field—crops and stock
   d. The farm management field—farms and enterprises
10. The County Agent as an Advisor.
   a. The need and value of advice
   b. The nature of the advice
   c. The difficulties and dangers of advising
   d. The application of the expert to the community
11. Progress in New York State.
   a. Present status of the work
   b. Problems and difficulties
   c. How to organize a farm bureau in New York State
   d. Summary of results to date
12. The Probable Future of the Work.
   a. Its scope
   b. Its support
   c. Its results
13. The Farm Bureau Agent.
   a. Qualifications
      (1) Farm experience
      (2) Technical training
      (3) "Mixing" ability
      (4) Age and reputation
   b. The size of the job
   c. Success depends largely on the man

TEXAS

A three-hour course in agricultural extension and demonstration, offered for one term to seniors, gives a brief history of the development of extension and demonstration in agricultural colleges, the organization in the Federal Department of Agriculture for demonstration and extension, the organization under the Smith-Lever Act, other agencies doing extension and demonstration work, the numerous lines of activity in extension and demonstration and the most effective methods to be employed in the work. Lectures, assigned readings, problems and practice in presenting subject-matter

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to varied audiences constitute the work of the course. Courses in agricultural education, educational psychology, methods of teaching, and rural problems are important to give preparation for this course, but they are not prerequisites. The purpose of this course is to prepare men to do extension work in the employ of agricultural colleges, railroads, and other private agencies, to do the work of a county demonstration agent, and to do efficient community work as a teacher of agriculture in the high school.

In further explanation of the methods to be employed in this course, the professor of agricultural education writes:

"The major part of the work in this course is made up of definite practicums to be worked out by individual students. For instance, a student will be assigned a kind of audience on a particular occasion and be asked to select a subject for presentation to this audience. The work is planned by the student and submitted for approval before the date set for the presentation. In most cases the class will have to serve as the audience, as is frequently the case in practice teaching in our schools. After the student has presented his subject in the best way he knows how, the class will discuss his plans, methods and results. A great variety of experiences will be given in the class to indicate the specific problems that different types of extension and demonstration men have to solve. In this way we hope to approach as nearly as possible to the actual conditions that will confront the extension man. It is hardly probable that we shall be able to use the class with actual demonstration audiences. In our course in methods of teaching we are getting some excellent results by using the class for practice teaching. We are hoping to be as successful with the extension phase of the work as the teaching."

WISCONSIN

Outline of Summer Session Lectures in Agricultural Extension Methods and Problems, Madison, Wisconsin, June 22 to July 30, 1915. Lectures by K. L. Hatch, unless otherwise designated.

1. Agricultural Education as Defined by Federal Enactment.
2. The Smith-Lever Act: Its Purpose, Scope and Possibilities.
3. State and National Organization for Agricultural Extension Work.
4. The Principal Lines of Agricultural Extension Activity.
5. The County Agent System in the United States.
6. The Operation of the County Representative System in Wisconsin—E. L. Luther.
7. The Past, Present and Future of the Short Course Idea.
8. Demonstration Farms and Farm Demonstrations vs. Trial Plats.
9. Types of Movable Schools.
10. Agricultural Extension through Cooperation.
11. The Relation of Agricultural Extension to Market and Farm Credit Problems.
12. The Place of Farm Management Demonstration in Agricultural Extension.
13. Press, Printing and Publicity Procedure.
14. The Place of Agricultural Extension in Secondary Education.
15. Graphic Representation.
16. How to Get Good Pictures for Agricultural Extension Work, With Demonstration—L. N. Brown, University Photographer.
17. The Making of Motion Picture Films—M. E. Diemer, Photo-Chemist, Forest Products Laboratory.

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18. The Agricultural Extension Activities of Industrial Corporations, Financial Concerns and Transportation Lines.

19. What One Railroad is Doing and How this Work is being Done—F. R. Crane, Agricultural Extension Agent, Great Northern Railroad.

20. The Plan, Scope, and Purpose of the Agricultural Extension Work for the Northern Pacific Railroad—R. F. Murray, Agricultural Extension Agent, Northern Pacific Railroad.

21. Our Information Bureau: What It Is and What It Does—A. J. Curtis, Engineer, Universal Portland Cement Co.

22. The Agricultural Extension Methods of the American Steel and Wire Company—H. E. Horton, Agricultural Commissioner.

23. The International Harvester Company's Agricultural Extension Department—P. G. Holden, Director.

24. The Growers' Service Department of the H. J. Heinz Company: Its Purpose and the Opportunity It Affords—T. V. Ellzey, Manager.

25. Why the American Bankers' Associations and Various State Associations are Interested in Agricultural Development and How They are Fostering It—R. J. Wheeler, Member Agricultural Committee of Bankers' Association.

26. The Organization and Administration of Agricultural Extension in the North and West—L. A. Clinton, Agriculturist, United States Department of Agriculture.

27. Practical Cooperation Between the State and National Departments of Agricultural Education—C. H. Lane, Chief Specialist in Agricultural Education, United States Department of Agriculture.

CONCLUSIONS OF THE COMMITTEE

Large numbers of trained men and women are needed to develop and carry on the various lines of extension work in agriculture and home economics contemplated by the Smith-Lever Act and the Federal and State Acts appropriating funds for similar purposes. This report is limited to a discussion of the training needed along agricultural lines, leaving for future consideration or for some other committee the discussion of training for home economics extension.

For the present, at least, more attention is likely to be given to the preparation of young men for county agent work and similar general agricultural extension projects than to definite efforts for the preparation of extension specialists along technical lines, and so the conclusions drawn by the committee have kept the county agent mainly, though not exclusively, in view.

It is agreed generally that the factors which make for success in county agent positions and other like extension work are (1) personal fitness, embodying such qualities as alertness, initiative, accuracy, facility in acquiring and holding the good will and confidence of others, leadership, and moral stamina, (2) technical and professional training, and (3) experience in the practice of agriculture and in extension work.

The personal factor probably is of greatest importance, for no matter what technical training or experience a young man may have, he cannot hope to succeed in extension work without those qualities which make for personal fitness. That these qualities cannot be supplied by college training or experience where the foundation for them does not exist, is admitted, but the fact that many young men are lacking in too many of them to hope for success as county agents is not a valid argument against technical and professional training

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for extension workers. Nor is it an argument against such training, or against the formulation by agricultural college faculties of systematic undergraduate curricula for extension workers, to say that the unfit will flock to such courses. What if they do? They flocked to the professional courses in forestry and in pedagogy, but the colleges continue to conduct such courses, and their graduates as a rule are succeeding better and commanding better positions than are young men of equal native ability who have not received technical and professional training. The farming communities of the country are looking to the agricultural colleges to supply them with technical advisors and they want men who are experienced and trained to give information, demonstrate effective methods, and bring order and organization out of chaos.

The question is—How are the agricultural colleges to meet this demand? Several methods are suggested. One is to hold winter short courses in extension methods and practice for college graduates who have been out of college long enough to demonstrate their ability as farmers; another, to select promising candidates from the graduating classes and put them through an apprenticeship or a course of training. Both suggestions are good, but alone they will not supply the present demand; much less will they provide for the normal growth of the extension movement. A third method undoubtedly will need to be employed, and that is for the colleges which have the necessary facilities to offer courses or groups of study which will enable students so inclined, not later than the beginning of the junior year, to begin systematic preparation for extension work.

UNDERGRADUATE WORK

It will not do for us to argue against the formulation of such courses on the hypothesis that a large percentage of the first year students do not know what lines of agriculture they want to follow. It may be that they have not decided definitely or wisely upon their future occupation, but they are here. We have admitted them to college, and we must do our best for them. What if a considerable number of them do believe that they want to prepare to engage in extension work? If they ask us to advise them as to the studies which they should take and as to the sequence of studies, we must give them what assistance we can, and if a considerable number of them are first year students, probably we shall begin outlining a four-year extension course.

After all, it will not be such an enormous undertaking, with our experience and with the numerous courses we already catalogue, to block out a tentative, more or less flexible, undergraduate course for prospective extension workers. Many of our colleges have come to the point where they require all agricultural students to pursue the same studies during freshman and sophomore years, and in these two years they put most of the sciences and some of the fundamental courses in agriculture. This would be a very satisfactory beginning for a county agent course.

Other colleges, in which the work largely is elective, outline in their catalogs several recommended curricula, one of which usually is called a course in general agriculture. That would be an excellent foundation for prospective county agents to build upon. If to either of these typical courses a few required courses in rural economics, rural sociology, and extension methods are added, students who have made up their minds to prepare for extension work will get about all we have to offer them at the present

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time in the way of resident undergraduate training. And it would be a good course, not only for prospective county agents but also for students who are uncertain as to their future occupation.

If there is need of weeding out, or keeping out, a considerable number of those who are attracted by the somewhat spectacular stage setting of some features of extension work, this can be done by prescribing a rather high prerequisite in farm practice; not necessarily for entrance to the college of agriculture, but for entrance to a professional extension course.

Some such prerequisite seems to be necessary. Among those consulted by the committee there in an overwhelming sentiment (over 89 percent) in favor of farm experience as a prerequisite either to entrance upon, or to graduation from, a professional extension course. And since this experience should cover the calendar year, rather than merely the summer vacations, it is almost imperative that students be required to offer farm experience for entrance. What period of time this prerequisite farm experience should cover is a matter upon which there is much difference of opinion. It should not be less than a full calendar year, and ought to be much more. But whether the time be long or short, practically all will agree that it should be sufficient to familiarize the candidate with the ordinary farm operations on a well managed, diversified farm, and to acquaint him with the farmer's point of view.

As to the relative amount of required and elective work in the undergraduate course, no very definite recommendations based on semester credits can be given. Standards differ and subjects are variously built up. However, we believe that enough of the work should be prescribed to make sure that the student will master the principles of physics, chemistry, botany and zoology in their applications to agriculture, and the fundamentals of agriculture. These subjects, added to those usually required in language, history, and mathematics, would make a minimum requirement of at least 50 percent of the course. In many of the colleges it would amount to about 75 percent of the course. Half of the course is the minimum which a large majority of our correspondents would prescribe.

This would leave from 25 to 50 percent of electives, but, in the opinion of the committee, not all of the electives should be so-called free electives.[1] As suggested in our 1911 report, it should be stipulated that a certain minimum, say about 12 percent of the whole course, be elected in major and minor agricultural groups, so that scattering may be avoided and moderate specialization in some phase of agriculture encouraged. It will be better, even for the county agent, to secure thorough preparation in some one phase of agriculture than to devote the whole time to general courses.

We believe that both required and elective courses in rural sociology and rural economics, including farm management, should be provided, that courses in agricultural pedagogy and rural education should be made available, that courses dealing with extension organization, methods and policy should be developed at an early date, [2] and, furthermore, that considerable attention should be given to training the student in presenting his ideas to varied and various audiences, through the written, printed, and spoken word and through diagrams, charts, lantern slides, exhibits and the like. If he is to become a successful extension worker, he must be a teacher and should learn to use all the devices of the profession.

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1. Proceedings 25, p. 30 (1911).

2. Ibid. Provision for these courses can be made by reducing the modern language requirement suggested in our previous report.

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GRADUATE WORK

The completion of the ordinary four-year undergraduate course in agriculture, without a greater amount of practical experience than the colleges are in a position to insist upon, will not give adequate preparation for the full responsibilities of the county agent position. Those graduates whom the colleges are willing to recommend for such positions are the exceptional men, who are older or have had exceptional experience not enjoyed by the majority of college graduates. If, therefore, the colleges undertake to give courses with reference to the position of county agent or other positions requiring similar practical attainments, they should take into account methods for securing such of the necessary practical experience as is not made a condition for graduation from the bachelor's degree course. So far as their facilities will permit, they should provide also resident graduate work in professional subjects for such young men as are able and willing to devote themselves to thorough preparation for extension work. This does not mean that every agricultural college should attempt to develop and supervise graduate courses and practice work for extension candidates. On the contrary, it would be better, perhaps, if in the beginning only a few of the better equipped institutions were to attempt work of this kind, but the point we wish to make is that young men who are ambitious to secure the best possible preparation for extension activities should have an opportunity to pursue graduate work suited to that end.

As already indicated, the graduate work should include both resident graduate courses and practice. The resident graduate work should not differ materially from that of other graduate students in agriculture, except that advanced work in rural, social, and economic lines should be urged. Upon the satisfactory completion of one year of such work, the usual master's degree should be conferred.

The postgraduate practice work should round out the previous experience of the student in farming and extension work. If he has previously managed a farm successfully, this feature of his postgraduate work may be omitted, or at any rate he should be given due credit for what he has done. If he has had successful experience in extension work, it should receive proper credit. But at the end of his graduate career he should be able to show to the satisfaction of the college authorities that he has successfully conducted a farm enterprise and has engaged with success in one or more phases of extension work.

As to how satisfactory practice can be arranged for, under supervision of the college, several good suggestions have been made, and to these the committee will add one or two. The farm experience should carry with it full responsibility for some farm enterprise, responsibility for the financial as well as the operative side of the project. This may be accomplished: (1) by placing the student as a hired manager of a farm or of some part of a farm, as the dairy, the poultry plant, or the crops, (2) by arranging for him to take over and manage the home farm under close supervision of the college, (3) by placing him on a farm owned or rented by the college, as is done with the "farm management farms" in Minnesota, or (4) by developing a system of accredited farms, as in Wisconsin.

The student's extension experience may be acquired in part while he si doing his resident graduate work, by sending him out (at his own expense until people are willing to pay for his services) in company with an experienced man to address meetings, to teach in movable schools, or to help in organization

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work. He should also spend a period of several weeks or months wholly in extension practice, uninterrupted by the requirements of resident graduate work. During this time he might assist first one and then another successful county agent in office work, in field visits and meetings, in taking farm management records, and in field demonstrations, or he might be employed as teacher of agriculture or assistant teacher in a vocational high school and thus come in touch with farmers and their problems through the supervision of the pupils' home projects in agriculture.

The vocational high school has been quite a recruiting ground for county agents and there is no reason why it might not be developed more fully as a training school for both extension workers and teachers of agriculture. In New York, through an arrangement between the state supervisor of vocational agricultural departments in high schools and the professor of agricultural education in the state college of agriculture, students in the college who are preparing to teach agriculture are given practice in teaching as assistants to the regular teachers of agriculture in high schools, and practice in the supervision of home projects by spending their summer vacations in assisting these teachers. This plan might well be applied to practice in extension work, particularly in states where the high school teachers of agriculture are required to do extension work.

All of this practice work by graduate students should be so managed and supervised as to enable the college to safeguard itself and the reputation of its graduates. A simple but comprehensive system of reports from both student and employer and of checks should be in operation from the start, and some officer at the college should from time to time see the candidates in their work and give them needed advice and assistance.

SUMMARY

Summarizing, the committee believes that a considerable number of the agricultural colleges should formulate and offer courses for the preparation of extension workers, that both undergraduate and graduate courses should be provided for, that familiarity with the ordinary farm operations on a good farm should be a prerequisite to entering the undergraduate course, that enough of the undergraduate work should be prescribed to insure mastery of the agricultural applications of physics, chemistry, botany and zoology, and of the fundamentals of agriculture, that moderate specialization should be provided for through group electives, and that by means of required and elective courses adequate provision should be made for work in rural, social and economic science, in professional courses for the teachers and the extension worker, and in public speaking and other forms of self-expression.

We believe that graduate extension work should be developed in at least a few of the agricultural colleges, that both resident graduate work and practice should be provided for, that one year of resident graduate work should lead to the Master of Science degree, that postgraduate practice should round out the previous experience of the student in both farm operations and extension work, and that this practice should be supervised by the college or its accredited representatives.

A. C. TRUE,
T. F. HUNT,
H. J. WATERS,
A. C. MONAHAN,
J. F. DUGGAR,
W. H. FRENCH,
Committee.

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On motion, the report of the committee on instruction in agriculture was received and 2,000 separates ordered printed.

The report of the committee on graduate study was submitted by F. B. Mumford of Missouri, acting chairman.

Report of the Committee on Graduate Study

In pursuance of its report presented at the Washington convention of 1914 and accepted by the Association, the committee on graduate study begs leave to report that preliminary arrangements have been made for a session of the Graduate Summer School to be held in 1916 at the Massachusetts Agricultural College. The committee has been fortunate in securing again the services of Dr. A. C. True as Dean and also has appointed Dr. C. E. Marshall, Director of the Graduate School of the Massachsetts Agricultural College, as Assistant Dean.

The general arrangements regarding lectures, seminars, demonstrations, laboratory work, excursions, etc., will be similar to those of previous sessions. In arranging the courses of instruction, emphasis will be laid on the local facilities and environment to bring out the points of greatest advantage which the Massachusetts Agricultural College and its New England environment have to offer such a school. It is proposed to make special arrangements whereby groups of students may have the opportunity to study the research and extension work in progress at the Massachusetts Agricultural College under the guidance of the experts in charge, and also to offer some laboratory work in special lines. Every effort will be made in the choice of men and subjects to have the strongest presentation and discussion of the methods and results of research along the lines included in the courses given in the school. Special attention also will be given to methods of instruction on certain lines.

Instruction will be adapted strictly to the needs of graduate students. Special efforts will be made to attract persons already in the service of the agricultural colleges and experiment stations.

Two lines of work of general interest will be emphasized. These are based on the general idea of "growth" considered from the standpoints of biology and social science, and will include courses on the biological factors in the growth of plants and animals and on selected topics in rural economics and sociology. Lectures and other exercises will be offered based on the problems of intensive agriculture, including work on topics under the general subjects of agronomy, horticulture and dairying, together with related work in entomology, agricultural chemistry, botany and micro-biology.

In conclusion your committee desires to repeat in substance two paragraphs from its former report.

While improvements in the character of its work may doubtless be made, the results already obtained in the Graduate Summer School are such, in the judgment of the committee, as abundantly to justify the effort and expenditure made. The most pressing problem at the present time, in our opinion, is the securing of adequate utilization of the advantages offered by the school by the institutions whose funds supply a large fraction of its financial support.

It scarcely seems necessary to argue before such a body as this concerning the vital importance of the promotion of research as fundamental to all the activities of the institutions, or regarding the stimulus and uplift to be derived by the individual investigator from the formal instruction of the Graduate School and from the personal contact with leading scientists and with his

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colleagues in other institutions, which it affords. Your committee has repeatedly urged these considerations on the Association and it now recommends that this convention express itself in some formal manner regarding the importance to individual institutions and to the work of the Association as a whole of facilitating the attendance of officers and assistants of the colleges and stations upon the sessions of the Graduate Summer School.

For this purpose it again offers two resolutions which, in the press of other business, failed to receive consideration at the last convention.

Resolved. That it is the sense of this Association that the best interests of the individual institutions would be advanced and the efficiency of the work of the Association as a whole greatly furthered by the adoption of a definite policy whereby at least a certain fraction of the workers in each institution should be enabled to attend each session of the Graduate Summer School of Agriculture.

Resolved. That the Association recommends to the several institutions that time spent in attendance at the Graduate Summer School of Agriculture be not deducted from the vacation leave of members of the staff but be treated as an absence with pay on the business of the institution.

Respectfully submitted,

H. P. Armsby,
F. B. Mumford,
Howard Edwards,
For the Committee.

On motion, the report of the committee on graduate study was received.

On motion, a recess was taken until 8 P. M.

Evening Session, Wednesday, August 11, 1915

The Convention was called to order at 8 o'clock, P. M. by the vice-president, J. H. Worst of North Dakota.

The Vice-President. President Bryan is well known to the members of this Association. He is, at the present time, the oldest land-grant college president in point of service among us. He can count the anniversaries of his succession to the presidency of Washington State College as some of us can count our birthdays.

I am honored in introducing the president of the Association, President E. A. Bryan of Washington, who will outline "A National System of Education".

Presidential Address

By E. A. Bryan, of Washington

A national system of education

The counterpart of the theory of "local self-government" to which we, as a people, were from the beginning devoted, has been our scheme of local education. Among our English ancestors, the most primitive and imperative obligation resting on the free citizen was the *trinoda necessitas*–the triple obligation–the repair of bridges and roads; the repair of defenses, whether wall, hedge or ditch; and military service. Our colonial forbears added to the

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primitive duty of working the roads and militia duty, the obligation of providing for the modern defenses and the education of our youth.

The local school and the local church have been, from the early settlement, characteristic and universal. The academy and the college on private or church foundation strengthened this tendency toward the local and self-sufficing institution. For two centuries the school and college remained a non-governmental function. As a state function, the history of education is confined to little more than a century and its principal development belongs to the last half century.

Foreigners, accustomed to recognize in the educational administrative department of modern European constitutional governments, one of the most important portfolios of the central government, wonder that, in America, passionately devoted as it is to the ideal of universal education, there should be no cabinet position to represent and promote this most essential element of the national life.

To the American, the explanation is very simple. Under our dual system of government, in so far as education has been a state function at all, it has been relegated to the local community or state government. There was nothing, therefore, for a Secretary of Education to do.

At the very beginning of the constitutional period, the United States became possessed of a patrimony of public lands. This possession was destined to play a most important part in our national development, and in nothing a greater part than in our education. The declaration of the Ordinance of 1787 that "schools and the means of education shall forever be encouraged," has had more than the force of law—it has been truly constitutional. By universal consent the public land was in some way to further the nation's greatest aspiration, namely, the education of the people.

At the outset direct gifts for educational purposes were made to local organizations or communities, the government merely assuming the role of benefactor and undertaking no sort of control or direction of the methods by which the beneficiary should receive the benefits. This was in full recognition of the accepted doctrine of the local control of the school.

Next, gifts of land were made direct to townships or states, as in the case of the sixteenth section for common schools and an entire township to each state for a university. The role of benefactor still was maintained and much of the potential force of the gift as well as of its money value was thereby lost. It led, however, to the activity of state and local government in the management of the patrimony, and to the organization of school systems and institutions for carrying out the purposes of the gift, and this, in turn, led, in the next half century, to the permanent establishment of the governmental function in education and of systems of taxation and management on the part of the state and local units. There was nothing "national" about our system of education, except what was due to the common religious heritage and the common aspirations of the people, due in turn to the common racial origin of the settlers.

Our secondary and higher education was from the beginning essentially imitative in substance, ideals, methods and instruments. The American Cambridge was, in miniature, as far as conditions would permit, the English Cambridge. The creation of a special class—an educated class—capable of ministering to the spiritual and political welfare of the people, was the aim. The American college, for more than two centuries—yes, for two and a half centuries—was essentially monastic. A "monastic" was a "solitary", and to produce a "monastic", a "clerk", a "scholar", was the ideal of the American

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college, just as it had been the aim of its predecessor, the European college, which from the beginning essentially was monastic. The call of the college to the chosen youth of the land was, "Come ye forth from among them. Purify your garments; cleanse and sanctify yourself unto your high and holy calling." The scholar shall wear different garments, speak a different speech, preserve a different mien, maintain a different countenance from the rest of the community. His hands were soft, his body spare and weak and his eyes hollow. He lived in a past world, a dead world. He walked in the higher and holier realms of logic and rhetoric, of philosophy and theology. The bachelors constituted to all intents and purposes, an order, of which masters and doctors were merely higher degrees. Academies were the counterpart of the colleges—the doorway through which the devotees might enter. The curriculum came to assume an almost ceremonial and ritualistic function. When in a latter day, the deficiencies of the system for ministering to the needs of a real world, a living world, a world that must be clothed and fed withal, became apparent, the doctrine of "disciplinary" values, of "cultural" values—casuistry, pure and simple—quieted for a generation or two the hungering after real food for the real life which our people were to live. "Authority", by which was meant the dictum of the fathers, the supremacy of the verbal method and monastic ideals of scholarship long ruled and reigned over us. It was our inheritance from centuries of the verbalistic system. Its devotees formed a caste, honored by all, worshipped by some. It continued to reign over us without dispute, until the middle of the last century. Even yet, the monuments of this kingdom are all about us.

It was inevitable that if such a country as America should rise, then such a system as the verbalistic would fall. Under the spell of such an imitative system it is no matter of surprise that for the first half century of independent national existence, our government should be dominated by it, and that the land grant for educational purposes which reflected the aspiration of our people for universal education, should be handed over unconditionally by the national government to local institutions and governments. Nor is it a matter of surprise that local communities, spurred by these gifts to activity, in the establishment of schools and colleges, should have continued the old imitative system. Aristotle and formal logic, linguistics and forensic disputations were the food upon which the earlier state universities fed their disciples, just as they had constituted the food of the mediaeval colleges. "Words, Words, Words" was the only answer of the college, whether state, church or private, to the cry for intellectual food. "College bred" men, the "overcrowded professions," "culture" and "discipline" were the response of higher education to the cry of a new nation, throbbing with new life, new powers and new hopes and the intimations of the new science and the new industry and the new democracy.

The slavery question postponed the day of a better and truer answer. The new thought that an industrial democracy must have an education adapted to its real needs almost burst forth at the end of the first quarter of the last century, but the slavery problem on the one hand and the wonderful literary outburst on the other diverted the current into other channels.

The struggle of the new democracy was not destined to find expression in universal suffrage and representative government alone, nor in equality of all men in the eyes of the law, nor in the ejection of human slavery from the body politic, but also, more truly still, in a democracy of knowledge, in a democracy of efficiency, in an educational democracy in which the individual should achieve his education by means of the very instruments with which he was to

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do his life work, and the education thus established should be genuine education. It is education by means of agriculture, not for the sake of agricultural products, by means of the mechanic arts, not for the products of industry, by means of commerce, not for the abundance of goods, but for the sake of Man himself.

The culmination of the aspiration for a new education adapted to the needs of the new democracy was the establishment of the system of the land-grant colleges in the United States. No more mistaken or sinful interpretation of the movement could have been suggested than that it panders to a low commercialism. The conception was original and it was national in the ideals to be attained, in the instruments to be used, in the pedagogical methods to be employed and in the organizations to be established. We were not conscious of this fact then, we are but dimly conscious of it now, and we have been growing conscious of it but slowly during the past half century. None the less, the education with the new instruments, by the new methods, to the new ends, truly national in scope, is in distinct contrast with the imitative system of the past and in distinct harmony with the ideals of democracy—essential to its existence—and it is truly national. It is not only the realization of the *novum organum*, the New Instrument, but, also, of the new purpose, the new end.

The great revolution lay in the fact that the conscious nation, through its supreme legislative, now determined to effect a new purpose—a new end. Hitherto, the educational aims of our people, beyond the most elementary steps, were to secure through a small, select and isolated class, the abstract end of training the people in righteousness, creating laws and establishing justice. The "learned" class became sponsor through their abstractions of theology, law, and "learning" for the welfare of their fellows. Their preparation for this function primarily was by a literary and verbalistic regime. The supreme emphasis upon "mind" as a distinct entity from the body and its development by food proper to it, uncontaminated by any materialistic connection, was responsible in part for the rejection of science as an instrument of education and the utter avoidance of any utilitarian infection.

From this epoch forward, however, one, at least, of the purposes of education should be to minister to our common human welfare. Moreover, the end should be the education of the industrial classes in contrast with the exclusive education of the professional classes. The "new instrument" and the new method by means of the common things of life should train the man for the life he should have to live. A proper knowledge and use of our material environment and an understanding of the relation of these to the ordinary social welfare and to the physical and social as well as the intellectual and spiritual well being, shall be the goal.

The line between the old and the new is drawn clearly. On the one side lies the "learned" professions, constituting a small and select class, separating itself in knowledge, interests, occupations and attainments from the great mass of their countrymen, living off the stipend cheerfully paid for their support by the producing classes. Their education has been verbal, their tastes literary, their reasoning speculative, their faces directed to the past.

On the other side lies the great mass of the community who deal with material things and material concerns primarily—the great producing and consuming classes. Of these, there are the two grand divisions—those engaged in the great extractive industries, agriculture, mining, etc., and those belonging to the great constructive industries, architecture, manufacture and all others who manipulate material. Much that is fundamental, both in the

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sciences and arts, is common to both the extractive and the constructive industries. Between these, lies the great group devoted to commerce, transportation and trade. These all together form the industrial classes. The work and the workers in all these are inextricably interrelated.

Over against these industrial classes are the old time professional classes. Education was the basis of the honor, the prestige, the usefulness of the latter; what could education do for the former?

What stroke of genius, what guidance of Divine Providence, may have led, in the initial legislation, to the use of these two great comprehensive and generic terms, "agriculture" and "mechanic arts," and to the equally happy phrase used to define and describe the purposes of the system about to be established—"the industrial classes"—I do not know; but no more happy or illuminating phrases could have been found. The entire field of production, the whole realm of human industry, is involved in the phrases used.

And the methods and instruments which were to serve the new education were in like contrast to the methods and instruments which so long had served the old. The authority of the book was to give way to the authority of Nature; the literary to the scientific method; deductive to inductive philosophy; philosophic generalizations to scientific fact; the manna of idealism to the bread of life; the learned professions to the learned vocations; magna chartas of "liberties" to charters of opportunities and abilities, guaranteed by a knowledge of Nature and skill in the manipulation of her materials and products. The "industrial classes", for whom higher education had not been intended, were now to become the chief object of her solicitude. Not a single industrial class, but all the members of all the industrial classes were to be the beneficiaries, and that by instrumentalities wholly in contrast with those of the old system and adapted alike to the entire membership of these classes, to everyone who makes or manipulates or forwards or otherwise produces material wealth. Let us not forget for a moment where the line lies between the old system and the new national system born in 1862, between education primarily for a small and select literary caste and education for the vast producing multitude. It is not between one producing class—the farmers—and all the rest, but between the producing and the non-producing classes of society. Herein, hitherto, has been misconception and blundering, which have materially interfered with our progress.

The methods, curricula and instruments of the new national system of education indicate alike its distinction from the old and its solidarity within itself. Henceforth, education was to face in a new direction. It was to have a new mission. The new thought developed first in higher education. In the end, it has permeated secondary and elementary education. It has exerted a powerful influence in the modification of the traditional literary system and the traditional institutions, in so much that many account themselves apostles of the new system without knowing whence it came or how or why it came to pass.

To carry out this new national ideal of an education "of the people, for the people and by the people" a system of colleges and universities was founded with at least one institution in each state and territory, deriving, in part, the means of subsistence from national sources and confining its chief purpose to the national ideal. Here was an epoch, indeed!

Two things astonish us: First, that this, the greatest piece of educational legislation of the country should have been enacted amidst the throes of the Civil War. It was in 1862, when Bull Run had been fought, when the very existence of the Nation and the success of the great experiment in democracy

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were in doubt, that this great act of peace legislation, this act establishing a new and revolutionary system of national education in harmony with the genius of our political institutions, was passed by the Congress of the United States.

The other cause of astonishment is that a layman, not an "educator", should have been responsible for this, the most astonishing legislative phenomenon—so far as education is concerned—in our national history. It was not a graduate of one of our great universities but of the University of Hard Knocks who became the national benefactor in this most important legislation.

With a wisdom and conservatism worthy of the great statesman who conceived the new system, the transition from the old to the new and the final coalescence of the best and most permanent elements of both the old and the new, were provided for. Existing institutions, representative of the old system might, in certain instances and under certain conditions, become the embodiment of the new idea. With equal care to guard against revolutionary destructiveness, the law provided against the exclusion of old and tried elements of the traditional curriculum. That well known provision against the exclusion of "classical" studies does not refer to Latin and Greek, but it uses the word "classical" in that broader sense in which we use it in describing the best in music, art or literature.

It was inevitable that the new system should be put into operation by men whose education, tastes, philosophy and predilections were with the old system. The sad story of the first twenty-five years of effort, disappointment and loss will, when seen in the proper perspective, be one of the bright chapters in the history of education in the United States. Slowly, gropingly, patiently, persistently, untiringly, men worked their way through the outer darkness into the light of a new day. The advanced stage of the pedagogy of one of the grand divisions of the new system was of untold value in developing the other grand division. That is to say, the state of the mathematics, physics, and mechanics, fundamental to a broad development of the mechanic arts, was such as to afford a good foundation. They were exact and exacting in their requirements and automatically excluded weaklings and the immature and unprepared and set the mark for a proper collegiate training to those who should find their proper work in the other great field of production, that of agriculture. The enormous modification necessary to be made in the primary sciences which are fundamental to agricultural science, such as chemistry and biology, delayed the day of a similar pedagogical development in the second grand division. It was a long, long way even to a fairly successful use of agriculture as a means of education.

It still remained for the law specifically to set forth, in a formal way, what by implication was in the original act, namely, the essential ministry of the natural and physical sciences, and of that great correlating science indispensible to all industrial education, economic science. Indeed, political economy in 1862 and long after, was an inductive science scarcely capable of rendering essential service to industrial education. This apparent but not real omission from the organic act was set forth in the second Morrill Act of 1890 and the sphere of industrial life was rounded out by the addition of domestic economy.

Permit an aside here, to deprecate the lack of a proper use of that great and inclusive phrase "the mechanic arts," and the substitution therefor, in common parlance and college curriculums, of the subordinate term, "engineering". The term "engineering" by no means fills the concept of the "mechanic arts," and a broad field of future college development in this direction lies

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even yet unexplored. There are the fine arts and the liberal arts; there are also agricultural arts and household arts; and there are the mechanic arts which relate to all constructive work of whatever kind, and to the manipulation of all materials whether of clay, or wood, or metal, or what not. Most of us have judged all too narrowly in the use which we have made of the fundamental laws and technique of the mechanic arts as they lend themselves to an educational program.

The practical outcome of the establishment of this system which we describe imperfectly as the system of "land-grant colleges and universities," is interesting historically. We have stumbled forward with a narrowness and selfishness that seems natural to school men. The most astonishing fact is that we have failed to comprehend that we had established a system of national education—national in its legislative origin, and truly national and original in its conception both of ends and means. A half century later we are aware that the doctrine has engulfed the secondary and elementary schools and has affected profoundly the strongholds of the older system. There are those even who would deny that the land-grant colleges are the true exponent of the great forward sweep of modern education.

There are those who do not comprehend the ministry of the college in the education of the industrial classes, and who do not differentiate this ministry from that of the secondary or the elementary school, and who would make of the college, a school of arts and handicrafts. The persons who so interpret usually have a low conception of the word "industrial", as though it related to something servile, as though it were applicable exclusively to the wage earning class, as though it were linked merely with manual dexterity and a low degree of knowledge. They fail to understand that there is no material or force in nature, there is no field of human production, there is no branch of constructive work, there is no field of commerce, even, which does not rest upon fundamental laws; that these laws may be known and understood and used; and that the reaction of these studies and of this training upon the mind of man is as important as a means of education as it is in effecting human welfare.

There are those again who persist in their failure to comprehend the breadth of the movement, who assume that the national system relates to agriculture alone (and that in its narrowest sense), or, agriculture plus domestic economy, or these plus engineering, and who do not see that the new system involved an entire change in front, a revolution in means and methods and ends, the opening up of education to the great majority and a new conception of the relation of higher education to the state. On the side of agricultural education alone, it involved the development of the substance as well as the method of a new curriculum. The reason why agricultural education was rejected for a third of a century was because it lacked substance—anything worth considering. The rise of agricultural research and the extension of agricultural knowledge beyond the college to the people was but the rational and necessary sequence of the new national system. The patient development of curricula, methods and facilities and the conversion of abstract sciences pursued as ends in themselves, to concrete sciences used as instruments to the ultimate ends of service to mankind, are but chapters in the history of this great educational movement.

Since the movement was truly national in legislative origin, in economic basis, and in educational ideals, there should have been and there ought to be at this late hour, a National Department of Education presided over by a Secretary of Education, who should contribute to the unification and efficiency of the system, and to the development of its ideals for the education

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of an industrial democracy. There have been official attempts to measure the institutions of the national system by the standards of the traditional college of the literary system and to discredit those that departed from the old regime. There have been other attempts to reduce them from the position of colleges to that of trade and occupational schools. There have been still other attempts to narrow their sphere to the service of a single industry.

As a defense against misconception, attack and injury, a Federal Department of Education would have been of the highest importance. And it is certain there would have been such a department and such a secretary, had there not been within the Department of the Interior, for half a century, a rare lack of perception of our national aspiration in education, a rare lack of an understanding of the relation of education to the internal development of our Nation and a rare appreciation of the paramount importance of other and less vital concerns.

How startling that there should have existed, for half a century, a national system of education, so distinctive in its characteristics, so closely related to the national development, for which this Department was responsible, and that it should not have known it. The system was ready made to hand. It was the system of the "land-grant" colleges and universities. There was an institution of the type in each state. There was a distinctive ideal to be developed. The "leading object" (to use the words of the Morrill Act) in each was the same. There was work of national significance to do. New methods were to be discovered; new instruments to be invented; and a unity in the movement was to be devised. Each institution was to be accounted for in the national budget. How rarely strange that for more than half a century the sole function assumed by the responsible Federal Department should have been left to clerks and underlings whose sole task was the checking up of the accounts of the several states in the matter of addition, but not always in subtraction and division.

It is almost equally amazing that out of the same Department of the Interior there would have emerged under almost accidental circumstances a new Department—that of Agriculture—destined to develop with amazing rapidity, assuming not only the legitimate functions of such a National Department, but likewise absorbing the purely educational and pedagogical functions of the new educational system. This Department has stood sponsor, not merely for the agricultural side of the system, but likewise, in a measure, for all its other industrial phases, particularly that of home economics. This vigorous young giant, the Department of Agriculture, brought to life by reason of the agricultural college, easily has elbowed out of the way whatever feeble attempts at self assertion may have been made by the departments charged with the educational function of our National Government. From time to time, feeling the throb of the great national movement toward a rational system of education adapted to an industrial commonwealth, the Bureau of Education has made attempts to break into our local systems of secondary and elementary schools—at least, with sound advice. Baffled at every turn because it is an outsider to our purely local agencies, the Department seems to be wholly ignorant of the dictum that educational movements are from above downward, and to be wholly unconscious of the fact that it has ready made to hand and has had for half a century, a system for which it is responsible, a system through which the end in view could be accomplished, and yet which it practically has neglected. It is a system found in every state, fed from the national treasury. It is a system as broad and far reaching as human industry. It is in need of unification, and in need of pedagogical guidance; and yet at

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times wholly neglected and lacking the sympathy in its aims and methods, of the governmental department charged with the duty of representing the nation's interest in education.

The purely educational problems of the national system are many and important. The first step should be the establishment of a solidarity of interest between the land-grant colleges and universities in the several states and sympathetic relations. with the responsible educational department of the government. The institutions should be led to a common understanding of the ministry of the college and university on the one hand as contrasted with that of the elementary and secondary schools on the other. The institutions in the several states should begin and end their undertakings at the same academic stage. They should promote a just balance in the educational development of the several divisions of the industrial classes so that the one should not outrun the other. Agriculture, mechanic, commercial, economic and household arts and sciences should progress with equal pace. This is the theory which has dominated our politico-economic development for a century past. This is the meaning of our protective tariff theory to which we, as a Nation, have been devoted. Through this balance of the industries has come national power and prosperity. Our national educational system should be and is the counterpart in theory of the development and balance of the several industrial pursuits of our people. We need the strength and dignity and sympathetic guidance of a National Department of Education to accomplish these ends. Its primary function might well be the coordination of the existing national system of land-grant colleges and universities, the statistical and informational function of the Bureau readily sinking ino a secondary position in the Department. The Department of Agriculture then should divest itself of its growing pedagogical responsibilities and undertakings which already hamper its legitimate development, in a degree, and which properly do not belong to it. Great as the service of this Department has been, the original collegiate functions of the system already feel, in the pressure of such a highly specialized department, the unbalance which a strictly educational department would restore.

If, presently, such legislation as that proposed by the Page bill or the Hughes bill be enacted into law, covering a field of education affecting all the people and for which, under no pretense could the Department of Agriculture be held responsible, the administration of the law would fall naturally and easily into a Department of Education.

There is no necessary reason why such expansion of the national industrial ideal in education should overthrow or even seriously disturb our state and local systems. Yet it would carry downward surely and rapidly into the lower schools, the ideals and the methods and the substance which the land-grant colleges and universities so patiently and so successfully have developed.

It would be absurd to establish a vast and far reaching system of education, no matter if it be called vocational, and entrust its development to the combined tender mercies of a Department of Agriculture, a Department of Commerce, a Department of Labor, etc., merely because these several departments touch upon their prospective interests in the industrial classes; and the addition of the Post Office Department to this hydra-headed federal vocational board promises little that is remedial in such a system.

Nor are we looking for a duplicate system of education. We are looking for the rationalizing of the existing system which shall adapt it to the needs of an industrial commonwealth. All that the idea of these vocational proposals involve we now have in the basic national system of higher education, which,

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if extended, under a wise Department of Education to the aid of secondary education and not distorted by the over stimulus of a single industry will modify our existing school system to meet the new and growing demands.

I have not a word to say, in this connection, concerning Washington's dream of a National University, nor of the modern amendments to his conception, except this, that, should it develop out of the system for which the great Departments of Agriculture and Education are sponsors, it would add one more means of molding our hybrid people into a homogenous nation.

Under recent developments we are liable to forget that the center and soul of this great epoch-making movement after all is a "college"; that primarily it is an educational movement, and that the trunk out of which such vigorous branches as agricultural experimentation and extension grew must be maintained in its proper strength and development as the true source of life. The college well may say, "I am the vine, ye are the branches."

I am fully conscious of the danger of disturbing the delicate balance of local and state education, and of the preciousness of the individuality of each institution. Your Alma Mater is your own dear mother whose life and personality is precious in your sight. There must be therefore the greatest care and breadth of view on the part of the national government in the extension of the new system of national education. But is not the same care essential in our finance, our commerce, and in every other phase in which the national government touches our national life? Dominated by a broad and liberal policy, we may well entrust governmental function in finance to a Department of Finance, Commerce to Commerce, Labor to Labor, Agriculture to Agriculture, and Education to Education. But we cannot entrust wisely an educational movement which involves practically all classes of society and every type of industry to a department charged with other and serious duties. We should entrust it to a Department of Education. We need such a department and we need it now.

The development and unity of our national ideal in our system of land-grant colleges and universities have suffered somewhat from a seemingly wise provision of the original organic act. It seemed wise when the first Morrill Act was passed to permit existing institutions to modify their aims so as to make the "leading object" of such institutions conform to the new ideal, thus enabling them to become the land-grant colleges of their respective states and the beneficiaries of the national legislation. The grant might be made to colleges and universities whose "leading object" was instruction in agriculture and the mechanic arts. The ultimate effect has been the establishment of two types of institutions, with the use of two words, "college" and "university", neither of which is well defined in American usage. Confusion and difficulty and a certain lack of a solidarity much to be desired has been the result of this provision. Both institutions may begin at the same point, employ the same facilities, use the same technique, rely on the same fundamental laws, proceed by the same methods to the same distance and with the same efficiency, and yet the pride of name may enter as a disturbing element in a uniform national system of education. The public as well as the student and the faculties is disturbed in mind. The popular imagination attaches to a university a curriculum as wide as the universe, though as a matter of fact a genuine university might have a very narrow curriculum, and there might exist a very broad curriculum with a slight resemblance to a real university. The popular notion again is that a limited progress of studies of a purely technical character, relating solely and narrowly to agriculture, measures the length and breadth of the agricultural college system. Such

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a college, according to the popular notion, is comparable in all respects and parallel to the single department of agriculture in an institution called a university. Thus, not only is the equally broad conception of the mechanic arts overlooked, and the broader conception of the education of the industrial classes, but more important still, the basic necessity of the primary sciences which every technical division feeds upon as the very bread of life, is wholly ignored and the eyes are shut to the vital fact that the educated man, whatever may be his field of activity in life, must feed also upon correlated subjects of higher education. A division of agriculture in any college or university above all others, if separated and isolated from the institution, would die.

It is interesting to note that in the twenty of our state universities which are the land-grant institutions of their respective states, the ideal of our national system has become the dominating ideal of the institution, and the objects of the national system, as a matter of fact as well as of law, are the "leading objects" of these institutions, whether the institution is conscious of it or not. The old ideals, ends and means of college and university life in these cases, have given way largely to the new; the old "learned professions" have yielded, in the eyes of the youth of the land, to the new professions and vocations. The new national ideal and system occupy an undisputed preeminence in the minds of the people. Fortunately or unfortunately, we have the land-grant state college and the land-grant state university. Each has exercised a great influence over the other. The state college again and again has recalled the university to its original task of service to the industrial classes; the university, on the other hand, again and again, has lifted the state college out of the slough of low scholarship. The interchange of teachers and curricula has been of the utmost importance to both. From both alike, the great and beneficent Department of Agriculture has drawn its recruits. From 1887 until after 1900, this our Association united both in the separate and combined institutions an undisturbed development of the new ideal. The solidarity of interest too often has been confined to a single department—that of agriculture, but it should be extended through the entire realm of education in so far, at least, as it affects human industry. A danger lies within the universities themselves, of a lack of a true perception of the length and breadth of the national ideal.

A fuller recognition of the entire national movement would lead us to the establishment of experiment stations in the realm of the mechanic arts as we did long ago in agriculture. In that period the backward stage of agricultural science made such a step imperative. Today America is on the verge of its life as an agricultural people and in the beginning of the stage of manufacture for a world market. In fifty years we will be in the industrial stage in which Germany is now—or was a little while ago. Our future is linked with our progress in the fundamentals of the mechanic arts.

We are conscious already of the fact that our progress in agricultural production has outrun our understanding of and control of economic law, and even now we are laying the foundation in the economic investigations and teachings of the colleges and the Department of Agriculture for the proper development of this phase of the work.

If we comprehend in a measure, the length and breadth of the new national system for which we stand sponsors, if we properly coordinate and balance the several agencies at our disposal and, if, with unity of purpose, we are able to realize, in national organization, the possibilities of the system, we may be able to give an account of our stewardship of which we need not be ashamed.

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THE VICE-PRESIDENT. Dean T. F. Hunt will outline "The Methods of Work of the Agricultural Institutions in California".

AN ACCOUNT OF THE METHODS OF WORK OF THE AGRICULTURAL INSTITUTIONS IN CALIFORNIA

BY T. F. HUNT

Last spring a letter was received from President Thompson which read in part as follows:

"The Executive Committee last week unanimously decided to request you to go on the general program on the following theme, or such statement of it as you might prefer, namely, The Plan of Agricultural Operations in California. The committee seemed to think it would be very desirable to have some account of the work at Fresno, Riverside and elsewhere and to set out in a paper the method of procedure," etc.

To this invitation the following reply was sent:

"Your letter of May 3 *** has been received. I do not feel at liberty to decline your invitation although I have much hesitation in accepting it, for the obvious reason that it puts me in the position of discussing and even defending our own work before our guests. However, if you are willing to accept the responsibility for the invitation and for the wording of the title, I will comply with the request."

The more I have analyzed the situation the more I must confess I am puzzled concerning the reason for this request. Even if it were possible to demonstrate that the method of procedure is a successful one, it does not follow that such procedure would succeed elsewhere or if it could be made to succeed would be desirable. We believe it is a good method, or we would not follow it, but it may as well be confessed that I have applied all those yard-sticks by the means of which success ordinarily is measured and find that each projects beyond the size of the cloth, whether measured lengthwise or sidewise, except possibly in the case of the stick of popular appreciation. However, the California spirit of appreciation and helpfulness, known to Easterners as the habit of "boasting and boosting," makes this stick a variable one.

California has an area equal to the nine North Atlantic States, the six New England States, plus New York, Pennsylvania and New Jersey. These nine North Atlantic States have ten agricultural experiment stations, ten separate organizations and twenty-five millions of people. California has one organization and two and one-half millions of people. It has all the agricultural problems of the North Atlantic States and in addition has problems of which the man who always has lived in a humid climate never has dreamed. Further, most of the agricultural investigators of the world have lived and continue to live in humid climates and have studied the problems of humid climates. The best that can be said for the California organization is that it has made, or more correctly is endeavoring to make, a virtue out of a necessity. Instead of saying the problem is hopeless because of its size and complexity, the organization has said, we will make a better college of agriculture because of the size and complexity of the problems involved.

The physical aspect of the situation may be illustrated by referring to the fact that we have a farm adviser in Humboldt county and a substation in Imperial valley. It is only within the last year that one can go by rail from Eureka, Humboldt county to El Centro, Imperial county in three days, and this only by spending two nights on a sleeper. The average rainfall at Eureka

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is 46 inches. There are parts of Humboldt county where in some seasons one hundred inches of rain falls. Four inches of rain never have been known to fall in Imperial valley in twelve months. A member of the staff of this college has traveled, within the state, 16,000 miles in 16 weeks in the necessary conduct of his work.

Doubtless the Executive Committee had in mind only research and education when it asked for this paper, but the title in the program "Agricultural Institutions in California" offers an excuse for discussing the subject in a somewhat broader aspect. The purpose of the college of agriculture is to discover and instruct, but not to control any person's actions. The United States Department of Agriculture differs from a college of agriculture in that it does not attempt to give resident instruction. A college of agriculture differs, or to speak more correctly should differ, from the United States Department of Agriculture in that it does not possess police functions. The University of California is recognized by the State Constitution. Four functions of government therefore are recognized in this State, namely, the executive, the legislative, the judicial and the educational. It must be perfectly obvious that in California, as indeed elsewhere, police powers are an executive and not an educational function. The argument that certain police powers, because of the technical character of the control, can be exercised best by the experiment station is equally as specious as the argument that the executive branch of the government must conduct its own investigations in order that it may know how to act. The fact is that the two functions largely are incompatible. In many instances, it would not be far wrong to say in most instances, a man who has a law to execute will not think his problem out to its logical conclusion where his job depends upon his not doing so. Of what value is a station's opinion concerning the use of hog serum if one-fourth of its revenues are obtained from the sale of said serum? Suppose a police department has organized an efficient staff for the prevention and control of insect enemies and fungus diseases: What would it do if its own research lead to the discovery that only one-half of the staff and only one-half of the appropriations were needed for the conduct of its work? Would it publish its researches? Did it ever occur to you that nearly every federal, state and county employee is engaged in controlling somebody's action? Go into any county in any state and run your eye over the officials. Most of them wear a star, if not on their coats then on their suspenders. There is nothing, apparently, that an official cherishes so much as police powers. Has it ever occurred to you that every state should have one institution whose duty it is to discover and whose only power it is to tell the truth? Let me illustrate how it works.

A certain county in California has one paid official who does not have any police powers. He is known as a farm adviser and not as a county agent, because in the judgment of the writer the latter term smacks of police powers. One of the supervisors in that county decided to try to have a law passed which he insisted quite vehemently the farm adviser should enforce. The farm adviser was quite disturbed, for he knew the policy of the University, and yet he was afraid this supervisor might induce the county board to withdraw its financial support. The farm adviser was told that it was a matter of comparative indifference whether or not any particular county had a farm adviser. The University only wished to place them where they were wanted, and if this county did not want him he could be transferred readily to another county. We told the supervisor that we did not know what the farm adviser thought about his proposal and we did not care what he thought,

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but whatever he did think, it was his duty, if asked to do so, to advise the local authorities what action in his judgment they should take; but under no circumstances would he be allowed to enforce the law if they passed one. The fact was, the county had a thoroughly capable police officer with plenty of time, whose natural duty it would have been to enforce such a law if passed. The point I really am trying to make is, that all this came about because neither the supervisor nor the farm adviser had fully grasped the idea that the only functions of the University are to discover and to teach. When the idea really is comprehended, it will be found to have a far reach.

This same farm adviser came to us one day and said that he was called to Mr. Blank's farm and found his cattle to be suffering from a contagious disease. After advising him to the best of his ability he asked, "Why did you not call the live stock inspector"? "Why, you know" the farmer replied, "we knew you didn't mean us any harm and we did not know what the inspector might do to us." "What should I have done?" asked the farm adviser, "should I have informed the live stock inspector?" The farm adviser was told that it was his duty to try to persuade the farmer with all the power he possessed that it was in the interests of the community and his own interest to call in the live stock inspector and to have the place quarantined, but that action on that subject should be left entirely to the farmer himself.

We may as well be frank about it, this policy is not one that makes for popular appreciation. The majority of the people like to be knocked down with a club. When a man swings a big stick, everybody takes off his hat and shouts for joy. If you are looking for immediate results, do not adopt the policy I have outlined. I cannot present you with any evidence that it will work, in fact I have some evidence that it does not, but I feel as sure as I stand here that if the agricultural colleges are going to justify the vast sums of money they are spending, they must analyze their own motives and they must make their methods of procedure conform with the legitimate functions they were created to perform, which are the creation and diffusion of knowledge.

In order that you may understand the agricultural work of the University of California, it is necessary to explain the general methods of procedure in the University as a whole. The most important unit is not the college but the department. Legally, perhaps, the college is the more definitely recognized unit of the University, but in practice certainly, and especially from an administrative point of view, the University is a collection of definitely organized departments, the heads of which report directly to the President. The title of Dean or Director is largely ornamental and serves to indicate who is to preside over certain meetings or to indicate to whom students may go for counsel and advice. In my own case, for example, I get such privileges as I possess, and such responsibilities as I must assume, not because I am Dean of the College of Agriculture, nor because I am Director of the Experiment Station, but because I hold the archaic title of Professor of Agriculture. The various subdivisions of the Department of Agriculture are known as divisions, such as the division of agronomy, division of animal husbandry, etc. Each of these divisions has all the privileges, all the responsibilities and all the budget that in most other institutions is accorded to a department. They are in fact to all intents and purposes departments, made so, however, by the head of the department and not by the action of the Board of Regents.

In this institution the matter of an academic title is an important one. It was not sufficient to give to Dr. Webber the title of Director of the Citrus Experiment Station and Dean of the Graduate School of Tropical Agriculture,

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but it was essential that he be given the title of Professor of Plant Breeding. If, therefore, you notice that some of us bear an imposing array of titles, you will understand they were given in order to comply with a certain type of organization for which the University of California is perhaps peculiar.

Neither does the academic title a man bears indicate the function or functions he performs. You cannot tell from his title whether he is a teacher, an investigator or both. We do not say a man is Professor of Agronomy and Agronomist to the Experiment Station. We simply say he is Professor of Agronomy. As head of that division, he willy-nilly has charge of all the activities of that division and largely he determines what the activities of that division shall be. Whether the emphasis shall be placed on teaching or investigation or even upon extension, it is chiefly his duty to determine and to organize his division accordingly. Naturally he will be held responsible for the results. We even give the men employed under the Smith-Lever Act an academic title. We do not know our field men officially as farm advisers. They are recommended and elected as assistants or instructors in agricultural extension. There is nothing in our plan of organization to prevent them being promoted to an assistant professorship or even a professorship of agricultural extension. They thus have such faculty privileges and responsibilities as their rank entitles them to. Please observe that it is not claimed that this is the best way or even the right way; but it is necessary for you to know that it is our way before you can understand our procedure.

Outside of our extension work which includes thirteen counties, the department of agriculture of the University has eight centers of activities. Three of these centers, Berkeley, Davis and Riverside, may be considered the major centers while Fresno, Whittier, El Centro, Santa Monica and Chico may be referred to as minor. The last two are forestry tracts where we merely keep a care-taker and may be forgotten in this discussion. The six points at which members of our staff reside permanently are:

A.—Headquarters, Berkeley.
B.—University Farm, Davis.
C.—Graduate School of Tropical Agriculture and Citrus Experiment Station, Riverside.
D.—Southern California Plant Pathological Laboratory, Whittier.
E.—Imperial Valley Experiment Farm, El Centro.
F.—Experiment Tracts, Kearney Ranch, Fresno.

At least twice a year all of the members of the institutional staff bearing the title of professor or assistant professor, meet in Berkeley on the campus for the transaction of such business as ordinarily comes before a faculty and to discuss the many questions which must arise in a department of such wide and diverse interests. Among other reasons in order that committees may have an opportunity to meet and report, these meetings always occupy at least two days. Thus on Friday of this week, the staff meets from 5 to 6 P. M. and on Saturday at 2 P M. it will meet again and presumably will remain in session until its business is completed. However, should there be occasion for another meeting on Monday, out of town members would remain here for that purpose. The next meeting of the staff probably will occur in November. In the interim each one of the three groups, Berkeley, Davis and Riverside, will hold approximately monthly meetings for the transaction of such matters as may be of local necessity or interest.

The University Farm at Davis is a tract of 779 acres in the lower Sacramento valley, where the University conducts four types of activities.

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(1) Some of the divisions of the department of agriculture conduct their investigations there wholly or in part.

(2) Juniors and seniors who are candidates for a degree in the College of Agriculture may go there for one or two semesters.

(3) A three-years' course in agriculture is maintained there for students who may have reached college age but who do not have college requirements for admission. No person is admitted under eighteen years of age, unless a graduate of a high school of recognized standing. Last year 168 students entered as freshmen in agriculture at the University, while at the University Farm School 170 entered for the first time, 86 of whom were graduates of high schools but not necessarily able to present the requirements for entrance for the four-years' course at Berkeley. The average age of the intrant at the University Farm last year was twenty years and one month. It is, therefore, not a secondary school and differs from the degree courses in that the course is a three-years' course; that no foreign language is taught; that the instruction in the pure sciences is more elementary in character, or speaking more correctly, not carried as far as at Berkeley and that as a consequence the technical instruction is modified to meet the need of students less thoroughly grounded in the sciences.

The school attempts to meet one of the phases of what I believe to be of the greatest educational need in America today, namely, the suitable training for the man or woman who has reached college age without being able to present college requirements for admission.

(4) A series of six-week courses for farmers, occurring in October and November.

It is the primary aim at Riverside, located in Southern California, to develop a research department of the highest character. The chief problems are those surrounding the practice of irrigation in an arid climate. We are working out these problems perforce through the chief crops of the region, which happen at the moment to be oranges, lemons and walnuts. We are looking forward also to the day when, through our relations with Central and South America, we will be called upon to train men for the tropics. Thus we are preparing to take graduate students who may wish to be among the first to extend commercialized scientific agriculture into a region whose development must mean much to the welfare of humanity.

It has just been stated that the primary aim of the Citrus Experiment Station is research. It must be admitted, however, that the people of Southern California are so hungry for the last word in horticultural practice and the men located at Riverside and Whittier have such a reputation for the knowledge, whether they have it or not, that a great part of their time is taken up with extension work. Most of the orange orchards of Southern California are within two hours' ride of the station and practically every grower owns one or more automobiles. I spare you the obvious joke that I would be supposed to perpetrate at this point. The natural result is that visitors often take up the time practically of the whole staff which in reality should be given to that type of investigation which requires long and continued attention to details.

It is necessary, perhaps, to say a word about the Kearney ranch at Fresno, which no doubt fires the imagination, and rightly so, of our Eastern friends more than any other portion of the University's property. Mr. M. Theo. Kearney willed a remarkably well developed ranch of 5,400 acres to the University for a suggested purpose with which it has not yet complied. One important reason for the delay in developing this property on the lines proposed

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by the will is that the Regents inherited a $200,000 mortgage along with the property. The mortgage now has been paid off and the property continues to be managed by the comptroller of the University as an income bearing property. The Regents have taken out $30,000 over and above expenses and improvements annually during the past eight years. This is quite obviously six percent on $500,000 or three percent on $1,000,000, the price at which I believe is capitalized on the books of the University. Mr. Kearney probably expended on land and improvements somewhere between one hundred and two hundred thousand dollars. While the department of agriculture has no control directly over this property, it rents from the University a forty-acre tract upon which the division of agronomy conducts investigations, while the divisions of soil technology and viticulture are conducting investigations of an important character in connection with the Kearney ranch management. To avoid possible misunderstanding it should be added quite parenthetically, that all the profits that are derived from this estate or their equivalent are turned over to the department of agriculture for its work. Its staff dreams concerning the future of this truly great estate. Briefly, it desires to see this property divided into thirty or more units, each housing and employing fifteen to thirty students; one half of their time being given to actual manual toil while the other half is devoted to study at some central point to which all of the students will assemble from their several units. Perhaps you may say this was tried out fifty years ago and failed completely. The reply is that what we are proposing to do never has been tried anywhere at any time.

The representative of the London Economist called at my office about a year ago. He was searching for manuscripts. I told him that I was trying to think out some way of describing California so that a man who never had seen it would get the proper mental picture. His reply was: "You cannot describe California so that a man who never has seen it can understand it; and if he has seen it it is not necessary." So it is with the Kearney ranch. It would be hopeless to make you understand what we wish to do there if you have not seen the place, and if you had seen it you would be as crazy about it as we are. However, we do not desire to develop a certain type of agricultural education because it is necessarily the best type of agricultural education. In fact we believe there is no best type of education, agricultural or otherwise. We believe that education must vary with the needs of the individual. Our aim is to meet as far as practicable the varying needs of the young men of California. It should be said here again, that the Kearney Ranch School is merely a day dream. How many years this dream is ahead of the times, we will not venture to guess. However, it may be said in all frankness, that the department of agriculture is handicapped, and it is a very serious handicap, by that easy attitude of mind for which the Californian is noted, of believing that he already has the best there is. This is an attitude of mind that is not altogether foreign to other states, especially with regard to their agricultural colleges.

At this point I stopped and reread what I had written. I am more puzzled than ever over the invitation of the Executive Committee. I have said about all there is to say and yet do not appear to have said anything worth while. I will blunder along just a little more and then leave you to ask any questions you may have to ask.

It is the contention of the University that it is not located in Berkeley but that it is located in California. This is particularly true of its College of Agriculture. A graduate student of the University may take his graduate work anywhere in California provided he is under the actual supervision of an

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instructor. This contact between instructor and student must be real and vital and not merely perfunctory. A student residing in Riverside cannot take graduate work with an instructor residing in Berkeley, nor can a student residing in Berkeley take work with an instructor resident in Riverside or El Centro. A student residing in Berkeley may do work with an instructor whose permanent residence is at Davis provided the instructor spends a portion of his time in Berkeley, as is the actual fact in some instances. The whole point is that graduate work may be done anywhere in California provided the instruction is real, but not otherwise. This is a general university policy which has special significance in the College of Agriculture.

The requirement for admission to the University, including the College of Agriculture, is 45 units, known in Eastern universities as 15 units. A student not only must have passed these 45 units, but each and every subject must have been recommended by the high school as satisfactory for university entrance. If a prospective student has passed 45 suitable units but is recommended only in 42, he cannot enter the University without passing an examination in the unrecommended units. A considerable number of students graduate from the high schools of California who are unable to enter the University for lack of this recommendation from the high school. A diploma from a high school and a recommendation to the University are two quite different things. Attention has been called to the fact that of the 170 intrants to the University Farm School last year, 86 were high school graduates. For the reasons just explained, it does not follow that any or all could enter the degree courses at Berkeley. The principal point to be brought out is, that, on account of the University Farm School at Davis, it is not necessary to let down the bars for students entering the courses in agriculture at Berkeley. We merely say to the student or his parents, that the University Farm School is open to him if he is unable to offer our requirements for admission, provided he is eighteen years of age. On the other hand if a student fails in the degree courses in Berkeley, he is not permitted to enter at Davis. There are always a certain number of students, especially in other courses in the University, who, failing for lack of any earnest purpose, suddenly find that they have a deep longing for the soil and are quite sure that the University Farm School is the place that just fits their needs. These cases often sound quite pathetic, but they never "get by", for reasons that are well understood by administrative officers.

In the College of Agriculture the freshman and sophomore years must be taken at Berkeley. Before entering on their junior year, each student is required to have completed the following four technical subjects; agricultural chemistry, soils, plant propagation and the principles of breeding plants and animals. These courses have certain prerequisites, such as botany, chemistry, bacteriology, geology and zoology. Therefore, no student can enter the junior year without having received a thorough foundation in the pure sciences and a comprehensive knowledge of the fundamentals of agriculture. It may be added that each of the four technical subjects below the junior year are taught by full professors. These full professors are told that it is a matter of indifference what else they may do so long as they give themselves body and soul to these beginning courses. When I observe that all four of these professors come through their semester's work each year almost physical wrecks, I feel sure that the students are getting the last ounce that is coming to them.

Between the sophomore and the junior years each student is required to take a summer practice course along the lines in which he expects to major. The methods of conducting these summer practice courses are as varied as the

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major subjects themselves, but all are intended to give the students some practical insight into his major subject before he enters upon its more theoretical study. It is believed to give him a better appreciation of his subjects of study and to give him an opportunity to back up and start over if he finds himself out of accord with the subject in which he intended to major. Each student is required to have a reading knowledge of some foreign language. When a student becomes a junior he is required to take a major subject. Only fourteen units out of sixty are required, however, so that theoretically a student may take any subject he wishes within certain rather wide limits during his junior and senior years. In practice, however, every junior and senior is under the supervision of his major professor. He cannot get his class card accepted until it has been approved by him. Ordinarily if a student is majoring in a certain subject he has a high regard for his major professor or he would be majoring in some other subject. Even if he did not, he knows that if he does not take subjects that are satisfactory to the major professor he cannot expect his professor to endorse him after he graduates. The character of the courses taken, therefore, depends largely upon the breadth or lack of breadth of the major professor and upon his persuasive powers. In other words, a student entering the University must make two choices: first, he must choose the college he will enter; second, in two years he must choose the subject within that college in which he will major. For the rest his choices practically are made for him, and yet it may be doubted whether any two students in the College of Agriculture ever take exactly the same course. In certain majors all the work of the junior and senior years is done at Berkeley. In certain majors it is optional whether it is all taken at Berkeley or in part at Davis. In other majors at least one semester is required at Davis; in others, two are required there. Out of 250 juniors and seniors now in the College of Agriculture, about 75 were at Davis last semester.

The requirements of the subject assigned to me, that is, "Methods of Procedure", has made it necessary to give you only the bones of the organization of the College of Agriculture. The flesh that we are trying to put on the skeleton I would not have time to develop, even had I had your permission to do so.

I can never prepare a paper concerning the College of Agriculture of the University, however, without in some form or other calling attention to Dr. Carver's dictum: "That if you admit that life is worth living, then you must admit that the highest function of man is not the promotion of science or literature or art, but it is the rearing of a successful family." This statement is of peculiar significance to every college of agriculture; and this College of Agriculture has swallowed it, bait, hook, line and sinker. The primary purpose of the College of Agriculture is not to enable the farmer to exchange his Ford for a Packard, although we are delighted to be of service in that direction, or to educate a man merely that he may make a worldly success, although we intend to do everything in our power to make this possible; but our chief purpose is to create successful homes in the open country.

On motion, a recess was taken until 9 o'clock, A. M., Thursday, Aug. 12.

MORNING SESSION, THURSDAY, AUGUST 12, 1915

The Convention was called to order at 9 o'clock, A. M. by President Bryan.

THE PRESIDENT. Director True will present a report of the exhibit of the land-grant colleges at the Panama-Pacific International Exposition.

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The Exhibit in Agricultural Education at the Panama-Pacific International Exposition

By A. C. True

The Association of American Agricultural Colleges and Experiment Stations, at its meeting in Washington in November, 1913, passed a resolution favoring "the proposition of making at the Panama-Pacific International Exposition an organized educational exhibit adequately setting forth the entire field of American educational effort and emphasizing its unity rather than its diversity." The ideas expressed in this resolution, in conformity with the views of other educational associations, were placed before the Government Exhibit Board for consideration, and an arrangement was perfected by which the end in view might be realized. This Board accordingly appointed Dr. P. P. Claxton, the United States Commissioner of Education, and myself, as a subcommittee to arrange for a general educational exhibit outlining the educational system of the United States. The work of this subcommittee was so divided that under my direction attention was given to the exhibit in agricultural education, more especially of the land-grant colleges and agricultural experiment stations, while the rest of the field was looked after by Dr. Claxton and his force from the Bureau of Education.

The United States Government had an appropriation for exhibits which, as usual, was managed by the Government Exhibit Board. The money allowed from this government fund was sufficient only to pay for some of the more general features of this exhibit, including especially the work of the Bureau of Education and the Office of Experiment Stations. The Association of American Agricultural Colleges and Experiment Stations had no appropriation wherewith to defray the expenses of making an exhibit in agricultural education, as it had at St. Louis, and the different contributing institutions were therefore required to secure funds from other sources to pay for their exhibits.

About 35,000 square feet of floor space was set aside in the Palace of Education for the entire educational exhibit, and of this approximately 5,500 square feet were allotted to the agricultural colleges and experiment stations. The Government Exhibit Board agreed to provide all decorative material and construction for this space, and to transport at its expense the exhibits to and from the Exposition, thus leaving to the contributing institutions the provision of the exhibit material and the cases or other means necessary for its installation.

The space of the college and station exhibit is divided into sections representing (1) the organization of these institutions, (2) their functions, (3) animal husbandry, (4) agronomy, (5) horticulture, (6) forestry, (7) agricultural technology, (8) soils and fertilizers, (9) rural engineering, (10) plant pathology, (11) economic zoology and entomology, and (12) rural economics and sociology. It was intended originally to devote a section each to agricultural chemistry and veterinary science, and to include botany and bacteriology in one section with plant pathology, and meteorology with soils and fertilizers; but it was not found possible to secure exhibits in these different subjects. The plans for the exhibit were made with a view to showing that the land-grant institutions have three general functions, research, teaching and extension work, and that they are divided into departments based on the subject matter.

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The organisation and functions of the agricultural colleges and experiment stations are outlined on a series of ten charts prepared in the Department of Agriculture.

The section of animal husbandry contains a model of a respiration calorimeter contributed by the Pennsylvania State College Institute of Animal Nutrition, where the original apparatus is used in nutrition experiments with cattle. Series of charts and graphic illustrations presented by the Kansas State Agricultural College and Experiment Station show the results of feeding studies with pigs, cattle, and horses. The College of Agriculture and the Experiment Station of the University of Missouri provided an exhibit illustrating research, teaching, and extension work in dairy husbandry, and the Oregon Agricultural College and Experiment Station contributed a model of a model poultry plant, together with illustrations of the value of selective breeding and rational feeding in poultry management.

The section devoted to agronomy comprises material supplied by the College of Agriculture and the Agricultural Experiment Station of the University of Illinois, illustrating work in corn breeding, in the use of fertilizers on different soil types, in corn growing, and in making a soil survey of the state, while material supplied by the Kansas Agricultural College and Experiment Station points out the results of experiments in the preparation of land for winter wheat, in crop rotation, in comparing pure strains of wheat as to yield and quality, on the influence of soil types and rainfall in wheat production; and of experiments with sorghums and corn as to their relative forage value. Exhibits presented by the Clemson Agricultural College and Experiment Station of South Carolina elucidate disease and insect attacks on the cotton plant, the possibilities of improving cotton by breeding, the manufacture of cotton from the raw stock to the twisted yarn, and the products secured from cotton seed.

Agricultural college and experiment station work in horticulture is illustrated by exhibits received from the Massachusetts Agricultural College and the College of Agriculture of the University of California. The material from the Massachusetts Agricultural College shows its work in floriculture, greenhouse construction, orchard management, more particularly pruning and spraying methods, and in the manufacture of fruit products: while the exhibits of the College of Agriculture of the University of California are based on the work of the institution in viticulture, enology, zymology and olericulture.

Exhibits for the section of forestry were provided by the University of Vermont and the Oregon Agricultural College. The exhibits from Vermont have reference to the location of state forests, forest planting, management, and inspection, nursery studies, and research work in dendrology. The Oregon exhibit included forest instruments, specimens of commercial woods, photographs showing students' field work, and a plan of the forestry building to be erected at the institution.

The material in the section of agricultural technology refers especially to dairy manufactures and sugarhouse practice. The College of Agriculture of the University of Wisconsin calls attention in its exhibit to courses in dairying, a number of dairy factory tests devised at the University, and a dairy survey of the State; while the New York State College of Agriculture of Cornell University exhibits photographs illustrating the teaching of dairy industry, more particularly cheese work, the management of market milk, dairy bacteriological studies, the study of butter, and farm dairy practices. The College of Agriculture of the University of Louisiana presents diagram.

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and photographs showing the relation between sucrose, reducing sugars, and gums, in the fermentation of sucrose solution and its bearing on cane sugar manufacture.

In the section of soils and fertilizers the New Jersey Experiment Station presents samples of New Jersey soils as representative of humid conditions, together with charts and photographs illustrative of soil investigations pursued at different times, special attention being given to methods of soil improvement notably by the use of leguminous crops. An exhibit contributed by the College of Agriculture of the University of California comprises a series of soil samples from each one of the upper nine feet of a number of typical California soils representative of semiarid conditions. The available plant food at different distances from the surface is illustrated and the mechanical composition of six typical soils is represented by the actual results of analysis, and their chemical composition is shown on a chart. A fertilizer exhibit also contributed by this institution consists of samples of different forms of nitrogen, phosphoric acid, and potash for farm use, and of photographs indicating the methods employed in fertilizer control work and in teaching the subject of soil fertilization. Samples of kelp are shown to call attention to this marine plant as a source of potash salts.

The section of rural engineering contributed by the Iowa Agricultural College demonstrates the principal lines of work pursued by its department of rural engineering and includes a model of a typical farmstead and other exhibit material showing the activities in teaching, research, and extension work in this particular branch.

The section of plant pathology consisting of but one exhibition case was contributed by the Massachusetts Agricultural College and contains photographs and specimens of different plant diseases, demonstration mounts of plant disease material, cultures of pathogenic fungi, types of spray nozzles used in plant disease control, and photographs illustrative of student laboratory work.

The section of economic zoology and entomology also consists of but one exhibition case which was contributed by the Utah Agricultural College and Experiment Station. In this exhibit the habits and destructive work of grasshoppers as well as the methods of controlling these pests, are illustrated. There are also models of the Utah grasshopper machine and the so-called "balloon" machine.

In the section of rural economics and sociology, material supplied by the Massachusetts Agricultural College indicates the possibilities of the Agricultural College as a factor for the improvement of rural social conditions and presents the results of rural social surveys. The College of Agriculture of the University of Wisconsin outlines its course in rural economics and reports in progress research work on cost accounting, farm and rural life surveys, the history of agricultural production in the United States, farm credit in Wisconsin, farm management, marketing and cooperation, and related subjects. The New York State College of Agriculture of Cornell University gives attention mainly to farm management problems in its exhibit which includes a farmer's work report and ledger account, a summary of accounts on the production and disposal of various crops, and certain other cost accounts from successful New York farms, in which it is shown that success was dependent upon the size of the farm, the efficient use of men and horses, and the interrelation of these factors.

It may be added, in conclusion, that the expense of making the preliminary arrangements and installing the exhibit was borne jointly by the Office of

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Experiment Stations and United States Bureau of Education. The Office placed Mr. J. I. Schulte of its force in charge of the preparation and installation of the exhibit and the Bureau of Education, under the Government Exhibit Board, bore the expense of his travel and subsistence in connection with the installation of the exhibit.

THE PRESIDENT. President C. A. Duniway of the University of Wyoming will discuss "Economic Sciences in Colleges of Agriculture and Mechanic Arts."

ECONOMIC SCIENCE IN AGRICULTURAL AND MECHANICAL COLLEGES

BY C. A. DUNIWAY

The popular need for short descriptive phrases has caused the general use of the title "Agricultural Colleges" for institutions represented in this Association. Such usage often has led to the point of view that these institutions are maintained solely or almost solely for the giving of instruction in technical agriculture. One need hardly remind the delegates here present of the errors involved in such a point of view. The scope of "land-grant colleges", whether existing in separate corporate organizations or as parts of more inclusive universities, is limited only by the terms of fundamental federal legislation and by charters from the states in which they exist. The leading purpose must continue to be the giving of instruction in agriculture and the mechanic arts, but the educational service to be rendered by an "A. & M. College" (using the phrase most current in the South), within the broad legal restrictions of federal acts, and determined by the proper authority in each state, certainly must include many elements of liberal education not strictly embraced in technical agriculture of mechanic arts.

Starting from such a major premise, this paper presents some consideration of the development of instruction in economic science which ought to be found in land-grant colleges and universities. The endeavor will be made, not merely to justify broader and deeper instruction in political economy on the ground of direct authorization in laws and charters, but also to advocate such development because important educational and practical results will be secured thereby.

An examination of the courses of study prescribed in colleges of agriculture and mechanic arts, or in departments of agriculture and engineering, reveals the elementary character of requirements in political economy for degrees in agriculture and engineering. The customary provision may be stated as one three-hours credit course for one year or an optional course of similar scope. A majority of students now getting their degrees in agriculture or engineering may do so without a single course of college grade in the field of political economy. If the inquirer then seeks for more complete recognition of this important science in our curricula, he will find with few exceptions scarcely anything but electives or options which are chosen by but few technical students. Somewhat better provision for this subject is possible usually in the colleges of agriculture and engineering connected with our state universities than in those separately maintained. But the amount of work of definite technical character prescribed in agriculture and engineering, combined with the tendency of students in these fields to be wholly absorbed in their major departments, produces about the same results in any case.

The reasons for this state of affairs already have been suggested in part, but they may be summarized as follows: Colleges of agriculture and engineering show the same tendency as other technical departments to make ex-

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clusive demands upon their students. Four years of work beyond high school training never suffice for complete inclusion of specialized courses which are of greater or less importance for professional ends. Slowly rising standards in most schools of law and medicine have enabled their faculties to require some breadth of education in pre-legal and pre-medical training, with the result that curricula in law and medicine are strictly professional in content. Faculties in agriculture and engineering still receive their students directly from secondary schools, but can not help wishing to make their curricula also exclusively professional.

In many institutions, also, the limitation of available income has inhibited attention to subjects not generally appreciated as practical, and political economy has not been recognized as one of the productive sciences. Classical political economy,—that of John Stuart Mill, for example—was so largely a historical and logical science and was so predominantly concerned with the theories of production, that it appeared remote from the practical problems of agriculture and engineering.

These considerations, when weighed either separately or together, will be found not really valid against the maintenance of strong departments of economic science. Indeed, a proper valuation of what may be called a "balanced ration" in higher education will require a new interest and a new emphasis on this phase of social science. No one any longer doubts the wisdom of "sharpening higher education to a point" of efficiency. Colleges of agriculture and mechanic arts are in no danger of forgetting their industrial purposes. They need rather to give heed to the inclusion of subjects which make for the highest efficiency in the long run—and political economy, properly understood and wisely interpreted, is just such a subject.

Modern economic science is less deductive than inductive, which is to say that it has vital relation to production, distribution and consumption. We cannot be content to train young men and women merely for productive industrial activities as wage and salary earners. It is becoming generally recognized that the weakest part of our industrial system is distribution. A farmer may produce crops of high standard in great abundance. He may be a failure nevertheless if he does not know and meet market conditions. He may be deprived of all his profits by deficiencies and manipulations of transportation facilities, by a faulty banking system, by the exaction of brokers and dealers. He may be the victim of conditions readily foreseen by one who had studied the fundamental principles of economic science and their practical application to farm management, marketing, transportation and banking. It is not unreasonable to urge that each year of college work leading to degrees in agriculture and mechanic arts include correlated courses of instruction in economic science, beginning with fundamental principles but particularly concerned with phenomena of political and economic life which profoundly influence industrial conditions. If our graduates do not understand fundamental doctrines of economic rent or of the law of diminishing returns, for example, how can they avoid pitfalls of misdirected effort?

It is a matter of common observation that this is an age of specialization, a period of high degree of division of labor, Among wage earners in industrial fields minute division of labor is a necessary factor in multiplied production and in low cost of production. In the higher ranges of technical and professional skill our typical organizations likewise are founded upon specialization. It has become increasingly difficult for the average individual to give attention to breadth of training and attainment. Investigators, teachers, and practitioners alike, tend to become artisans within narrow fields. As

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artisans they may and commonly do fail to understand the relations of their special work to community interests or even to correlated departments of work. Such results are fortunate only for the managers of large enterprises who need for their plans groups of mere specialists whose skill may be exploited. The largest financial rewards accrue to leaders of men who are not themselves possessed of any form of direct industrial skill. A happy measure of preparation for success may be expected when the individual is trained in some special form of skill but is made conversant with its relations to more inclusive fields and is able to appreciate its general economic and social values. The community also will be the gainer when it educates a large proportion of its college men and women so that they will become more than artisans, more than technical specialists. The obligations of citizenship in our democracy are insistent and universal. Every industrial question has its political implications. There is real danger that class consciousness and class interests may produce chronic struggles for supremacy. Only an intelligent electorate, or at least a large infusion of electors trained to understand principles of economic sciences and their application, will make possible wise solutions of politico-economic issues as from time to time they become acute.

THE PRESIDENT. President A. Ross Hill of Missouri will discuss "The Preparation of Teachers as Contemplated in the Nelson Amendment".

THE PREPARATION OF TEACHERS AS CONTEMPLATED IN THE NELSON AMENDMENT

BY A. ROSS HILL

The Nelson Amendment to the Morrill Act closes with the words, "provided that said colleges may use a portion of this money for providing courses for the special preparation of instructors for teaching the elements of agriculture and the mechanic arts". What are the institutions represented in this Association doing toward the realization of this new aim of the land-grant colleges and universities?

Only about half a dozen of them make no pretense to train teachers of elementary agriculture and manual arts and approximately an equal number offer courses for teachers in the summer session only. But these institutions are in most cases maintaining schools of music and the fine arts and engaging in other activities not so clearly falling within the functions of the land-grant institutions. A dozen or so have departments of education which offer typical courses in the history of education, school administration and methods of teaching, including in rare instances a course, usually a very brief one, on the teaching of agriculture. In some other cases students wishing such a course are advised to see the dean of the college of agriculture. About a dozen institutions have apparently gone one step farther by establishing chairs of agricultural, industrial or rural education; but in the majority of cases the chief or only result has been to give a little more time to the one course on the teaching of agriculture in grammar and high schools. This is just what might be expected, for by labeling a department "agricultural" or "industrial education" because the institution is a college of agriculture and mechanic arts, little is gained, especially if, as seems not unusual, the incumbent of the chair is selected not because he is an educator trained in agriculture or mechanic arts but because he has had training in pedagogy of the usual type and has sympathy with vocational education.

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A group of approximately a dozen institutions have established curricula in agriculture or mechanic arts or both for prospective teachers of those branches, and in the case of agriculture these curricula resemble the general curricula in agriculture, i. e., they require less specialization during the junior and senior years than is customary with the great body of agricultural students. They usually require a small amount of work in education but in some cases even this is entirely elective. In the case of mechanic arts, however, the special curricula for teachers differ much from those required of engineering students. In both branches some of the curricula are arranged for four years of teacher training and others for two years. So far as the individual courses that go to make up these curricula are concerned, they are in the case of agriculture almost exclusively, and in the case of mechanic arts mainly, intended for students who never mean to teach in the elementary or high schools. And on the other hand the professional courses in education that are included are planned primarily for those who expect to teach subjects other than those falling under the title of agriculture and the mechanic arts. In a very few instances a general subject matter course for one year occupying not more than three hours is offered to prospective teachers under some such title as "elements of agriculture". Courses in manual arts that are designed primarily for teachers are much more common. To what extent are these measures enabling the institutions to meet the demand for teachers of agriculture and the mechanic arts in grammar, rural and secondary schools?

So far as the number of teachers is concerned I am not in possession of accurate statistics, but I feel that I am speaking conservatively when I say that probably all of these institutions combined are not sending into service enough teachers properly trained for the teaching of the elements of agriculture and mechanic arts to meet the needs of one of the larger states. Perhaps in time this condition of affairs can be remedied, even by present methods, partly by training teachers already in service through summer courses and partly by interesting youth in the new possibilities of the teaching profession which arise from the growing demand for teachers of these branches. This latter work can best be done by our departments of education, but they will need the active cooperation of our special teachers of agriculture and the mechanic arts.

Aside from the question of meeting the demand for a number of teachers in these branches, are the methods we employ such as properly to equip youth inexperienced in classroom teaching for instructing pupils of the grammar and high schools in the elements of agriculture and the mechanic arts? To answer this question some analysis of the art of teaching is required, for as an art the successful practice of teaching is not based entirely or even mainly, so far as the grades below the college are concerned, upon technical knowledge of subject matter. And yet there is a sense, as we shall see, in which knowledge of subject matter is the chief qualification that training can supply the teacher.

In what follows, I have in mind that the great majority of courses in the elements of agriculture and the mechanic arts will be offered not in trade and agricultural schools but in public high and grammar schools, with a democratic program of studies in which these subjects are duly represented.

In the first place, the art of teaching is based on imitation. With the great body of teachers, especially with those who have not had the advantages of thorough professional training, teaching is essentially an imitative art. This applies not only to the methods of class management and instruction but even to the organization of subject matter and to the methods of approach

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to subject matter required of pupils. This means that the manner in which the fundamental courses of any subject or group of allied subjects are presented to college students tends to determine the manner in which the elements of these subjects will be presented by them if later they come to teach those elements in the lower schools. With this fact in mind I would urge that the college courses that are of greatest significance to the prospective teacher are those which in aim, spirit, and method are most closely related to corresponding courses in the schools below the college, that is those courses which along with some grasp of principles and methods of thinking seek to emphasize the point of view of the subject concerned and to develop appreciation. They are often called general culture courses. They might more accurately be described as courses in appreciation.

Now here is the point at which I fear our institutions are failing to meet the vital needs of teachers in training, except possibly in the summer courses. They are not offering, as are departments of biology, history, American government, etc., general courses in agriculture and the mechanic arts that would serve at once to give general insight into, intelligence about and appreciation of agricultural and mechanical problems and to afford, with reasonable adaptation, copies for imitation when the student attempts later to introduce grammar and high school pupils to these problems. Here is the sense in which knowledge of subject matter is of primary importance to the teacher, but it is not the customary interpretation of that dictum. Specialization is important for department teachers in high schools, but even with them more important still is the perspective, the outlook and the appreciation that comes from the pursuit of a fundamental broad course in the problem of their field of instruction.

The agriculture needed in the lower schools is not technical but practical agriculture, and highly specialized courses in the college do not give the best preparation for prospective teachers. Complaint is often made that college courses in academic branches, even in literature and history, fail to give the appreciation and call forth the emotional reaction that fit the student for teaching these branches in the lower schools. On this point Professor Yocum of the University of Pennsylvania says: "Although history through its dramatic content, and literature through its emotional form, are the branches most effective for emotionalizing ideas into ideals that can control (conduct), the method of the academic specialist in each of these subjects tends to lessen or check emotion by turning the attention of the learner from the emotional passage as a whole to petty details of information or the means by which the emotion is produced. In place of definitely centering about fundamental ideas and activities what is most impressive in the spiritual inheritance of the race, specialization sacrifices the emotional appeal of historical fiction and even of literary form, for the sake of eliminating anachronisms that the general student never perceives or soon forgets, or the fictitious heroes and incidents that make larger truths real." This indictment is severe and the statement extreme, but it expresses a weakness of specialized and technical instruction in the preparation of teachers which must not be overlooked; and the courses in our agricultural and mechanical colleges are quite as subject to criticism as in the case of academic institutions, perhaps more so because of the absence of general courses that serve as propaedeutic for the more advanced work in agriculture and the mechanic arts.

This situation could be remedied by offering, where the right man can be found for the task, a general course in agriculture running through at least one year which should be taken by prospective teachers as a prerequisite

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for the study of special courses in animal husbandry, dairy husbandry, field crops, etc. This course should not follow but accompany and run parallel with those in the fundamental sciences and serve to vitalize them. Personally I should put all students, at least those who did not have agriculture in the secondary schools, through this course before permitting them to register in special department courses.

Only two or three institutions in this Association are offering such courses now and apparently in these cases no other agriculture course is taken by prospective teachers. In manual arts, on the other hand, many of the institutions are offering courses in appreciation, intended primarily for teachers, as well as admitting teachers to courses in shop work intended primarily for engineers. How to get college teachers of agriculture suited to the training of teachers for the lower schools is at present a serious problem. The man to offer such courses should have had wide educational experience in teaching secondary school pupils and a sound and broad agricultural education. He will probably have to be developed.

So much has been said on the thesis that teaching is an imitative art and that the imitation applies to the organization of subject matter as well as to the methods of presentation. But teaching is also a reflective art and a study of the history, principles and methods of education should constitute part of every teacher's training. So far as a course in the teaching of agriculture is concerned that will naturally be conducted by the professor of general agriculture. But teachers of agriculture and mechanic arts should study educational problems in the boadest sense. Every one of these institutions should have a department of education, though that is not so important as the chair of general agriculture.

Furthermore, teaching is an art that can be improved upon and almost acquired by practice and experiment. All teachers in training should have opportunities for observation and practice teaching in vocational as in other subjects under competent supervision. This will force the adaptation of the student's knowledge of subject matter to the form in which it is suitable for younger pupils. The combination of study of educational principles and observation and practice teaching under proper conditions will partially offset the lack of the copy for imitation that should be set in the proposed general course in agriculture.

To summarize, the need of teachers of agriculture and mechanic arts is great, the demand is overwhelming, and thus far very little has been done by the institutions here represented. What should be done by every land-grant college and university would seem to be the following:

1. Establish a chair of general agriculture which should offer courses suited to introduce all students of agriculture to the special departments, and which should make a special feature of offering courses suited to the needs of teachers in the lower schools.

2. Maintain a department of education which should offer instruction in the history and principles of education and in the theory and practice of teaching and class room and school management.

3. Establish schools for observation and practice in agriculture and mechanic arts.

In addition to these measures, for which the administrative authorities of the institutions are primarily responsible, the faculties should take a general interest in the preparation of teachers in these lines and give some thought to the problems of elemetary instruction in agriculture and mechanic arts. For a few years a campaign to get prospective teachers interested in adequate

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preparation in these lines should be waged. Very few people looking forward to teaching have as yet realized the opportunities in these lines and they are guided largely by tradition in their preparation for teaching. In this connection the grouping of courses into curricula for prospective teachers has its value, but more decided efforts should be made to call attention to the opportunities of this great new field for teachers and appropriate training should be provided.

T. F. HUNT. Students of genetics are familiar with the curve which is formed when one plots a hundred potatoes, a hundred dairy records, etc. If one plots the records of a hundred students one gets a similar curve. The general run are located in the flat of the curve. What is troubling us for we have been working at this problem seriously, is to get the student whose records are located in the rapid upsweep of the curve to take the course of agricultural education and to teach in the high schools or anywhere else. That is our problem. I want somebody to tell us how to solve it.

I. P. ROBERTS of California. I would train the men who already are in the high schools, the material you now have. Do not try to make them in the universities, but go out and take these little schoolmarms and these high school instructors and start in on that foundation. My last class in agriculture consisted of six teachers in the Palo Alto schools, to whom I gave weekly lectures in their homes. Four of them, when chosen high school principals, recommended that agriculture be introduced. Teach just a few of the principles. Any good teacher can reach one of those misses of 18 years of age, who does not know why she is teaching except to get a living. Thus will the foundation be laid. I believe agriculture should be taught to children, starting in at eight years.

A. V. STORM of Minnesota. Is it not true that the high school requirements in California for teaching subjects other than agriculture are relatively high? Are not the requirements for teaching agriculture in the high schools very low? Are not higher salaries paid to Californian high school teachers than elsewhere? Should not the same requirements for teaching high school agriculture be made as for the teaching of the other academic subjects?

T. F. HUNT. Answering categorically three and non-categorically one of these questions. It is true that the requirements for the academic teachers are high, whether higher than in other states or not I cannot say. It is true that a student can get a special certificate to teach vocational subjects, including agriculture, in the high schools at the end of four years, provided the county superintendent wishes to give it to him, whereas it takes five years to get a general teachers' certificate. We claim that Californian teachers are paid a higher wage than those in other states; but whether that is true or not I cannot say.

An answer to the question whether increasing requirements for certification in agriculture would or would not increase the number of teachers, involves the consideration of the general problem of teacher certification. Californian teachers are largely women. The men are withdrawing from high school teaching work. Our graduates who have red blood in their veins and are ready to go to work have no trouble whatever in securing positions. They laugh at the idea of taking a five-years' course in order to teach in the high schools. The five-year students are not in the upper groove of the curve but are left-overs. Not an honor man will look at a high school position. High school teachers must be sought because they will not seek the positions. Why erect fences to keep them out when none of them wish to get in? Boards of

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education do not look at the problem in this light; but the results speak for themselves.

A. V. STORM. Is it not true that many who are teaching agriculture in Californian high schools are ill-prepared for the work?

T. F. HUNT. In stating that only eight of the 62 Californian high school teachers of agriculture have studied agriculture at the University of California, perhaps I have answered that question.

A. V. STORM. What do these men do when they teach agriculture? How much time do they spend in actual work, working out agricultural problems? What real enticement is there in this line of work to these men who records locate them in the upper portion of the curve? Why not raise the standard in a manner to induce men who really are worth while to take that course? In Minnesota we get some men from the upper portion of the curve.

T. F. HUNT. Will you not answer your own question and tell us how you secure upper curve men in Minnesota?

A. V. STORM. Last year 147 Minnesota public high schools received special state aid for teaching agriculture and other industrial subjects; and 176 will be aided in a similar manner next year. Our State Department of Education and State High School Board cooperate fully with our other educational agencies for the furtherance of education. They make the regulations under which these high schools receive state aid; and when I mention some of these regulations you will see there is something besides high standard in preparation that enables us to maintain the position to which we have aspired. For example, no man can teach agriculture in a state-aided high school who is not a graduate of a standard agricultural college with a properly distributed course. He must have fifteen hours of professional work, three of which must be in special methods for the teaching of agriculture and three must be in supervised teaching (practice teaching). He must be a twelve months' employee, on his job the year round. His term of service begins August 1st, a month before the school opens, so that he may become orientated. During six of the nine months he must be free one-half of each school day from all work connected directly with the school and must devote that time to community service. During the winter he teaches in a three-months' short course offered for the boys and girls who are not regularly attending school. He devotes the three summer months to community affairs, considering the children as part of the community in their home practice. This half-time requirement has been reduced now to not less than quarter-time; yet he may devote half of his time to the outdoor work if the school board and the superintendent so desire.

We have a system of rural schools associated with a central industrial school. A large number of outlying rural schools thus are brought under the direction of the city superintendent and under the influence of the teacher of economics, agriculture and manual training of the regular public high school.

We have drawn teachers from twenty different agricultural colleges. We have no trouble in getting all the good men that we need in these 176 schools. I think that we have been getting men largely from the upper portion of the curve and that we are rapidly eliminating those from the lower portion of the curve. A few get $1000 while most of them receive from $1200 to $1500 and upwards to $2000. The fact that the teacher is not confined to the schoolroom, but has something to do outside of it, is an incentive.

Some of these upper curve young men look forward to county agent work. They take high school work because it holds open the door of opportunity.

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C. D. Woods. Is it the practice in Minnesota for teachers to use the high school merely as a stepping stone to something else?

A. V. Storm. Is it not true that some of our best teachers have been men who have used the teaching profession as a stepping stone? Indeed, to what extent do agricultural college graduates remain in the other places in which they were located after graduation? Many men who enter high school work mean to remain therein. A former college graduate, eminently practicable and not in the least academic or didactic, returning for postgraduate work, told me recently that he wanted to take such subjects as would help him to do better high school work; that he had no desire to enter college or station work; and that he saw a great field in his own line. Another teacher was offered $2000 a year in county agency work; but he declined, believing that there is a better future for him in high school work than in county agency work; and he gave cogent reasons substantiating his point of view. Furthermore, we would be justified in expecting good service from these men, even though they left school work later; and we do not lose them all, no larger percentage than are lost in other lines. In other words, the early mortality is no greater than in other fields.

A. R. Hill. May I make two points very briefly? I appreciate the suggestion of Professor Roberts that we should begin with the teachers who already are in the service. Yet would you think of applying that method to teachers of Latin and biology and the other academic subjects; turning to those who already are in the teaching service? We would not think of doing anything of the sort.

Touching Dean Hunt's question, I would suggest that the dominant feature of the agricultural curriculum should be a sound, broad course in agriculture, furnishing a foundation for future special study in agriculture. If you make the work respectable you will have no trouble in securing the best men.

President Bryan. A paper on "Exchange Relationships in Agricultural College Work" will be presented by Dean H. L. Russell of Wisconsin.

Exchange of Instructors in Agricultural College Work

By H. L. Russell

During the last few years there has been a marked increase in the number of men who have been added to the staffs of the different agricultural colleges, and it seems quite likely that the development of agricultural work will continue to demand an increasing number of men for some years to come. In selecting these men it is of the utmost importance that the very best be chosen even for subordinate positions, as out of this class will come in the course of a few years the permanent faculties of our institutions. The chances are, under ordinary conditions, that some of the graduates of any institution stand a better chance of being selected as assistants than an individual from the outside. If a student has made an excellent record in his undergraduate career, even though he may have made no conscious preparation along teaching lines, the chances are that he is likely to be offered the opportunity to engage in teaching work. Again, the necessity of economy in salary frequently leads to the selection of men taken from their alma mater. These men start as assistants, but in a few years they are in the position of instructors, and while they may not have consciously chosen this career originally with the intention of remaining permanently in college work, yet if they succeed in a

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moderate degree, they are apt to be continued upon the staff for a period of several years even though they may not have had any special graduate training.

Most institutions giving graduate work afford an opportunity to their subordinate staff for the continuance of their preparation along graduate lines by allowing assistants a certain amount of time in which to take advanced courses, but the point of special importance which should be emphasized is that such work, generally speaking, is taken in the same institution in which their undergraduate work is obtained. If such development is permitted to go on without control the college executive soon finds some of his departments manned in large measure with graduates of his own institution. Such a course of inbreeding cannot but be detrimental to the best welfare of the institution. Most men engaged in teaching, especially in their younger years, give out that which they received and the young graduate is very apt to use the methods of work with which he is already familiar. The result is that inevitably a process of intellectual inbreeding occurs in which the methods of training in the institution have a strong tendency to perpetuate themselves without a radical influx of new ideas from outside sources. Personally it seems to me quite inadvisable to have more than one-half of the staff members in any department chosen from the home institution. Naturally, the percentage probably will be higher with the temporary staff, such as assistants and instructors, than with the more permanent professorial staff. It is, of course, the permanent staff which exercises the most potent influence in the establishment of educational ideals.

For a number of years we have made conscious effort at Wisconsin to overcome this tendency by requiring our own graduates to go elsewhere for graduate work before they would be advanced to professorial positions. This requirement was made in order to force the individual to broaden his horizon by study elsewhere, or by travel. In enforcing this regulation, we have found it inadvisable to reduce it to a rigid rule, but have tried to treat each case from the standpoint of what was the best course to pursue for that individual. In doing so it seems to me that it is not necessary to require in all cases a specific course of study of a graduate character. For instance, in animal husbandry, I regard it as of much more importance to the teacher of dairy cattle, that he possess a first hand acquaintance and knowledge of livestock conditions as they obtain in the various parts of Europe, in which our special breeds of dairy cattle have developed, than that he take a course of graduate study in some other institution. The instructor who is going to teach students in regard to this particular branch of agriculture should have a first hand knowledge of the Channel Island breeds; he should have visited the home of the Scotch, English, and continental types of dairy breeds.

More or less difficulties, however, are bound to arise in developing such a plan as the foregoing. First of all comes the financial difficulty in which the younger members of the staff find themselves. For a man on a meager salary of $1,000 to $1,400, it is difficult and often impossible for him to maintain himself for a considerable length of time where he is not continued upon the payroll of the institution. In many instances he is married and the added responsibilities do not permit of mobility of movement. The combination of these two factors frequently make it more or less of a hardship to enforce this regulation.

As a means of overcoming these difficulites, we are developing at Wisconsin the idea of an exchange relationship of instructors with sister institutions. In many branches of agriculture, the character of the instruction has now been standardized sufficiently so that it would seem possible to exchange

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members of the subordinate staff for instructional purposes without much difficulty. This certainly can be done with reference to such subjects as involve in the main laboratory work, such as chemistry, bacteriology, soils, dairying, and the like. Perhaps it may be more difficult with those subjects which embrace more particularly the art as well as the science of agriculture, such as those involved in live stock, field crops, and horticulture. The idea which I wish to present for the consideration of college executives is the possibility of making a mutual exchange of the younger staff members where each institution will take care of the financial relation which it bears to the chosen staff member, but permitting the substitution of service by a man of practically equivalent training and experience from a cooperating institution. An application of this method would solve the difficulties which now obtain with reference to requiring our graduate students to secure this necessary outside experience at their own expense, and yet at the same time conserve the rights of the institution itself. This plan has been tentatively proposed to two or three deans of agricultural colleges and has met with their general approval. Naturally, such a system of mutual exchange of staff members would have to be arranged for a considerable time in advance and would have to be considered with reference to each individual case. No general rule could be made which would be applicable to all cases and it is not to be presumed that the system could be applied to more than a very few cases in any one institution.

It has been deemed advisable to present the thought to this organization in order to give it wider circulation. Whether the scheme can be worked out in a sufficient number of cases to demonstrate its practicability remains to be seen, but it is offered as a method which may stimulate, to some degree at least, a conscious and definite effort toward the cross-breeding of agricultural college faculties, and thus minimize the narrowing effect which may come from a selection of too large a number of our own graduates in our several institutions.

E. E. Sparks of Pennsylvania. This paper contains the germ of a very feasible and practical scheme. I therefore move that it be referred to the committee on college organization and policy with the thought of seeing whether it can recommend some feasible method of furthering exchange relationships.

The motion was seconded and carried.

The President. The report of the committee on college organization and policy will be presented by Chancellor Samuel Avery of the University of Nebraska.

Report of the Committee on College Organization and Policy

I. The General Report.
II. Tentative Outlines of a Plan for Study of College Organization and Policy.
III. Bibliography on College Organization and Administration.

I. The General Report

Your committee first of all wish to acknowledge with thanks the hearty cooperation of the United States Bureau of Education. Commissioner Claxton has assigned one of the most efficient men of his staff, Mr. A. C. Monahan, as secretary of the committee. This insures greater efficiency for the committee than could be hoped for without a secretary who could give considerable time to the work, and it also secures the cooperation of this Association and the Bureau of Education in a common study of a very impor-

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tant field in education, namely, the administrative and business organization of our universities and colleges.

Your committee are impressed with the growing sense of the importance of this field in the minds of college presidents and deans, and, indeed, of all administrative officers in the institutions represented in this Association. These institutions have grown so rapidly and new problems have arisen in such a bewildering array, that it is not too much to say that the machinery of administrative organization that once sufficed is now entirely inadequate, and that it has been very difficult and in many cases impossible to build the new machinery as rapidly as the demands upon it have emerged. If we are to judge from opinions both privately and publicly expressed by college administrators, there is today a real call for a thoroughgoing consideration of the problem of administrative and business organization. It seems to be agreed that we need a more efficient system of administrative organization that at the same time has a minimum of "red tape". This fact also seems to outline the main task of your committee.

As in other questions of this sort, the first step is to attempt an analysis of the problem. Accompanying this report is an outline, somewhat in detail, of the present problem of administrative and business organization in our Morrill Act colleges and universities. Your committee make no pretension to the completeness or exhaustiveness of this analysis. But it is hoped that it may serve as a reasonably good guide to a study of the problem on the part of any one who may care to utilize it. Your committee, however, desire to make two specific uses of this analysis, expecting, of course, to enlarge and improve the analysis as added study may indicate. It is hoped, in the first place, that this outline of the problem more or less completely will be a guide for the future work of this committee, whatever its personnel; helpful at least. The committee also wish to send copies of this outline to each institution represented in the Association, with the request that each institution suggest names of persons particularly interested in any of the sub-topics in the outline, who later might be invited by the committee to make special study of some one or more of these sub-topics and to place the study at the disposal of the committee; also that these institutions be requested to furnish information relative to present practices in the whole field as outlined, together with suggestions for improvements.

It is hoped by your committee that in this way they may have at their disposal a considerable amount of expert advice and special study on this subject, which may enable them to present to this Association from time to time, not so much their own views, as the digested views of the best thinkers in this field. In this way also we hope to have the practical experiences of all our institutions and the advice of their administrators. Furthermore, it is hoped that when once this outline is placed before the officials of our institutions, it may be helpful and perhaps to some degree an incentive to those institutions to study carefully their own problems of administrative organization. At any rate, your committee request the active and cordial support of the various institutions in this Association in this attempt to develop a thoroughgoing study of that problem which is the excuse for the existence of your committee.

Thanks largely to the Bureau of Education, the committee are able to present also as a part of this report a somewhat extensive bibliography on the subject of "College Administration and Organization". Probably it is not necessary to suggest that even to busy administrative officers such a bibliography ought to be of great value.

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The problem of the organization of the extension service in all our agricultural colleges avowedly is an important and pressing one. This subject has been discussed before this Association through various reports, but almost always from the standpoint of good administration of the extension service itself. The more inclusive aspect of the question, namely, the relation of the administration of the extension service to the administration of the institution as a whole, needed, we think, some further study. Your committee, therefore, in cooperation with the United States Bureau of Education, addressed a letter of inquiry, concerning the general organization of the agricultural extension service in the state colleges of agriculture, to the president of each of the fifty institutions for white students, or for whites and negroes. It was hoped that the replies in all cases would be prepared by the presidents themselves or under their immediate direction, so that they would deal specifically with the administration of the extension service from the standpoint of the administration of the whole institution. In many cases, however, the inquiries were referred by busy presidents to the heads of extension departments with the result that the information submitted in such cases deals more specifically with the internal organization and administration of the extension service and less specifically with its relationship to the entire institution. Replies were received from nearly all of the institutions.

While in present practices there are nearly as many different forms of organization as there are institutions, there seems to be a tendency toward a similar form, one in which the extension service is a distinct administrative unit of equal rank with the teaching unit and the research unit. It is administered by the president either directly through a head of equal rank with the head of the teaching unit and the head of the experiment station, or indirectly through a "dean of agriculture" to whom is given a general oversight of all three divisions of the agricultural work: teaching, research, and extension. Instances of extension service organized as a sub-division of the teaching service or of the experiment station, are becoming more rare as the functions of the extension service are becoming more clearly defined and the scope of work increased. Opinions, as expressed in the replies to the inquiry referred to above, seem to indicate that there is a growing appreciation that the extension service is the carrying of the whole institution, including all divisions of teaching and research, to the people, and cannot, therefore, be a sub-division of either of these divisions. In a few of the smaller institutions, where one person serves as both dean of the college of agriculture and director of the experiment station, the extension work has been added to his other duties without any definite form of organization. In many of the institutions where no single person, except the president, has been responsible for all the agricultural instruction, the extension work has been added to the duties of the director of the station as the only person concerned in all lines of agricultural work. In nearly every such institution, the director of the station is engaged in teaching, serving usually as instructor and the head of a teaching subject-department, as for instance, the department of agronomy or the department of animal husbandry.

A few instances may be cited to show the trend in organization. The Agricultural College of the University of Wisconsin includes all agricultural work of the institution. It is under the direction of a single person serving under the title of "dean and director". He has three administrative assistants of equal rank: (1) an assistant dean of the college; (2) an assistant director of the experiment station; (3) an assistant director of the extension service. This arrangement is similar to that of the Massachusetts Agri-

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cultural College, where the work is organized into four groups instead of three, the four heads being responsible directly to the president: (1) a dean of the college, who has supervision of undergraduate students; (2) a director of the graduate school; (3) a director of the experiment station; (4) a director of the extension service. It must be remembered that the Massachusetts institution is a college of agriculture only and not a college of agriculture and mechanic arts, and that the organization, therefore, may be less complicated than in other institutions.

West Virginia University has a dean of the agricultural college, who is also director of the experiment station, and a separate person as director of extension. The director of extension, however, is responsible to the dean. In twenty-three other institutions the dean of the agricultural college is also director of the experiment station. In about half of these twenty-three, a director of extension is employed, who is responsible to the dean as in West Virginia. In others, he is responsible directly to the president and not to the dean. Kansas may be cited as an illustration of this latter condition; there the extension work is under a "dean of the division of extension". As has been stated, in several of the smaller institutions the extension work has been added to other duties of the dean and director. In Delaware, for instance, the direction of the extension work is a function of the dean of the college of agriculture and the director of the experiment station. In Alabama, it is a function of the "director of the experiment station and extension service", who also has oversight of the teaching in the agricultural department. Under this man in the extension work is a state demonstration agent, to whom all county agents report, and a superintendent of junior and home economics extension, to whom report the organizers and supervisors of agricultural and canning clubs for boys and girls, and the extension workers in household economics for adults.

While the tendency seems to be to make the extension service distinct from and of equal rank with the teaching unit and the experiment station, it seems to be the opinion that all three divisions, while under the immediate oversight of separate persons, should be under a single "dean of agriculture" in order that there may be the closest cooperation. It is the opinion of the committee that this is the most desirable form of organization. The trend of the practice, however, in several of the states is not in this direction. In Idaho, for instance, the extension service is one of the six units which compose the State University, taking equal rank with the other five, of which the Agricultural College and the Experiment Station are two. In North Dakota there is no relationship between the agricultural college and the experiment station and extension service. The director of the experiment station is also director of agricultural extension and is responsible directly to the board of trustees. The president of the college has no voice in the management of either the station or of the extension service. In Indiana, the extension department is organized as a division of Purdue University, under the immediate direction of a superintendent of extension, responsible directly to the president. It is a distinct division, coordinating in rank with the departments of instruction and the experiment station, but having no connection with either of these departments. None of the employees in the extension department teach in the college or have duties in the experiment station.

The form of organization in Illinois presents some marked differences from any of those mentioned above. Relative to it Dean Davenport says:

"We have no teaching division and no investigation division. We have an agricultural college and an experiment station with a division of extension.

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In our understanding, the college of agriculture covers all agricultural activities whether teaching, research, or extension. For financial reasons the research activities have been organized under the head of an experiment station and for the same reasons the extension service has its own organization with no special activities in teaching. In all of this we are attempting to administer the various funds and obligations without destroying the natural departmental organization of a university, and we recognize that every well conducted university department will do three things, namely: teaching, research, and extension work. The dean of the college is, therefore, also director of the experiment station and director of the extension service. There is no separate organization for extension service beyond the necessities of administration. For this purpose we have a vice-director for the immediate administration of the Smith-Lever funds; he is also, ex-officio, state leader in the county advisory service. We have, also, a superintendent of agricultural college extension covering those activities which are more especially connected with schools and with young people. These two offices are as independent of each other as two departments but both are responsible to the director of the extension service (the dean)."

Your committee would like to take up as soon as possible for special consideration the two important questions of business organization and of intrastate relationships—that is, the way in which the various educational agencies in each state may be coordinated into a genuine educational system, particularly, of course, as relates to agriculture.

The Association at its meeting last year instructed this committee to report an opinion on the question whether the presidents of the Morrill Act institutions, who are not members of the National Association of State Universities, and the deans of the agricultural colleges which are associated with state universities, should meet together to discuss common problems. Your committee discussed primarily the question whether the executives of the institutions not belonging to the National Association of State Universities should meet together, and endorsed the idea, but did not pass on the question whether the deans of agricultural colleges belonging to state universities should also be included. It appeared to your committee that the answer to this question, or either phase of it, is dependent to some degree upon the shape which the organization of this Association may take in the near future.

Your committee also were asked to consider the relationship to this Association of the Association for the Advancement of Agricultural Teaching. Letters presented to your committee stated that many members of the latter are desirous that it be absorbed by and be made a section of the former. Your committee are in sympathy with the wish of the Association for the Advancement of Agricultural Teaching for close affiliation with our work, but took no vote on the question, because of the unanimous opinion of the members of your committee that the question of absorbing the Association for the Advancement of Agricultural Teaching is a matter that should be considered by our own Executive Committee. We believe that the two associations should cooperate in every way, and that, if possible, their meetings should beheld the same week and at the same place.

K. L. BUTTERFIELD,
A. ROSS HILL,
S. AVERY,
R. A. PEARSON,
W. M. RIGGS,
J. M. HAMILTON.

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Tentative Outlines of a Plan for Study of College Organization and Policy

(The notes under the various sub-topics are intended as suggestions and not as completed outlines defining the scope of the study.)

I. Administrative organization:

1. *Function (including membership, powers, duties, etc.)*

(a) *Of the institution as a whole:*

General statement of the functions of the entire institution of which the agricultural college is a part, relative to resident instruction, research, experimentation and extension teaching.

Supplementary statements of the function of the non-agricultural college or department when necessary.

Special statement of the functions of the college or department of agriculture relative to:

(1) Resident instruction in regular collegiate work, graduate courses, short courses, summer schools, secondary schools of agriculture, and in other forms of formal teaching at the college or at permanent schools owned and controlled by the college.

(2) Research and experimentation concerning agricultural production, agricultural business, (farm management, buying, selling and banking), rural life, (educational, social, religious, recreational activities).

(3) Extension teaching in all phases of agricultural industries and rural individual and community life.

(4) Agricultural control work (food, fertilizer, nursery stock inspection, etc.).

(5) Public and private organizations and enterprises.

(b) *Of the trustees:*

Organization, powers, duties, etc.

Sub-committees, powers and duties.

Extent and character of the activities of the trustees in determining policies of the institution, in the employment and dismissal of officers of the institution, in determining course of study, entrance and graduation standards, control of students.

(c) *Of the faculty:*

Organization, powers, duties, etc.

In what matters should it have original jurisdiction and final authority? Should all acts be subject to the approval of the trustees?

Committees—organization, powers, duties; in what matters should committees have final authority?

Systematic plans for conferences, councils, cabinets, etc.

(d) *Of departmental organization:*

Relation of heads of departments to the president.

Coordination of teaching, research, experimentation, and extension within the department.

What should be the final authority with respect to educational matters, business management, administrative responsibility?

(e) *Of administrative officers:*

Relationship of president to trustees; of other officers to president and trustees.

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Should the president be the director of institutional policy, or simply the representative of the trustees delegated to enforce their regulations and carry out policies initiated by them?

Should there be any employee of the institution not directly responsible to the president?

(f) *Of alumni:*

What relation to the management of the college should the alumni organization have?

What proportion of the trustees should be graduates of the college?

Should there be an advisory council of alumni having no direct authority?

Relation of alumni to student activities, fraternities, athletics, publications, musical, dramatic and other clubs.

(g) *Co-education:*

Ways and means by which the opportunities of the institution may be opened to women.

(h) *By-laws:*

Governing methods of procedure within the board of trustees.

Pertaining to faculty relationship.

Rules governing procedure in handling business of institution.

2. *Relationships and correlation:*

(a) *Organization in* (1) *universities and* (2) *colleges:*

Of the teaching staff.

Of the research staff.

Of the graduate staff.

Of the extension service staff.

Of teachers in winter and other short courses.

(b) *Correlation of types of work and personnel:*

Research, teaching, extension; shall the same person do two or more types of work?

Should there be separate staffs for teaching, research, extension work, short courses? Or should each department involved have charge of each type of work?

(c) *Departmental cooperation and administration:*

How can projects in which several departments are involved be developed and carried out?

3. *Questions concerning the staff:*

(a) *Selection of officers and instructors:*

To what extent should the trustees leave the selection to the president?

To what extent should the president leave the selection of subordinates to the head of the department?

(b) *Terms of employment, dismissals, standard amount of work:*

Should the institution enter into a written contract with its employees? Or should the institution issue a statement defining its policy relative to the length of appointment to positions of various grades, and indicating other terms on which the appointment is made?

What should constitute a legitimate cause for dismissal?

Can there be a definition of the normal amount of work expected from members of the staff?

(c) *Vacations, leaves of absence, supplies, and compensation when ill:*

How much vacation with pay should be allowed annually to teachers, experiment station workers, and extension workers?

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On what basis should leaves of absence be granted?

Should the institution or the individual provide a substitute during a leave of absence?

Should extended periods of illness be regarded as vacation for the employee?

(d) *Salaries for special courses:*

Under what circumstances should an employee receive extra compensation from the institution?

(e) *Records and systems of reports:*

What kind of reports should be made by officers of an institution to their department head, to the president, to other administrative officers?

(f) *Correlation of salaries:*

To what extent can salaries be made uniform as between departments and types of work?

Should there be a published schedule of salaries, or should there be certain limits defined by the institution, thus permitting the grading of men within such limits, on the basis of their ability?

(g) *Retiring allowances:*

To what extent can state institutions provide retiring allowances for its officers? What should be the basis of such allowances?

(h) *Privileges:*

To what extent should the institution pay the expenses of its men to conventions, etc.?

To what extent should the institution require its officers to attend conventions, etc., at the expense of the individuals?

(i) *Employment in non-college commercial enterprises, or other forms of outside money-earning:*

Should an officer of an institution be permitted to render service outside of the institution for pay?

Should it be permitted with the approval of the president? Or should it be permitted provided reports be rendered to the president as to the extent of such outside service?

(j) *Professional betterment:*

How far can an institution go in demanding its officers to spend time and money in approved professional improvement?

To what extent can it legitimately cooperate with the individual in providing time and funds for such improvement?

(k) *Administrative duties:*

To what extent should administrative work, outside of departmental management, be assigned to teachers and others?

Should attendance at faculty and committee meetings be required and insisted upon? What penalty, if any, should be imposed for neglect of such duties?

(l) *Relations to trustees:*

Under what conditions should officers of the institution be permitted to take any matter to the trustees except through the president?

II. BUSINESS ORGANIZATION:

1. *Standard tests of business efficiency:*

What tests of efficiency can be applied to the business management, the operation and maintenance?

2. *Accounting and general accounting methods*:

3 *Cost accounting:*

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Of what value is a study of the cost of instruction in the various departments? What practical use can be made of the results of such a study?

4. *Auditing:*

Should the auditor be a subordinate to the financial officer, or employed by the president and trustees, and directly responsible to them, or a professional having no permanent connection with the institution?

5. *Budget, appropriations, apportionment:*

Should financial matters connected with the budget, apportionment, etc., be considered only by the president and financial officer, or by a council of directors, deans or department heads or by other faculty committee?

6. *Property problems—physical plant, supplies, general service, efficiency of plant, use of class rooms, etc.:*

What studies should be made in regard to the use of various class rooms, laboratories, etc.? By whom should such studies be made?

7. *The inventory, basis of value, depreciation, frequency;*

Should the inventory serve merely as a catalogue of the equipment of the institution, or should it indicate the value of this equipment, as nearly as can be determined at given dates?

What should be the basis of valuation?

What schedule of depreciation should be followed?

Should recognition be made of appreciation in value of real estate and buildings?

Should the inventory be taken annually?

8. *Correspondence, clerical help:*

Under what circumstances is it feasible to maintain a central office which would care for all the clerical work of the institution?

Should all correspondence pass through a central office for approval before leaving the institution?

How should correspondence bearing on expert advice be handled?

9. *Labor:*

Should labor be under the direction of a central office, or assigned to different departments?

When should student labor be employed?

10. *Projects:*

To what extent can the project system be applied, and how organized?

11. *Purchasing agent:*

Should a purchasing agent obtain all supplies for the institution or should heads of departments be authorized to purchase supplies?

What authority should the purchasing agent have in deciding whether or not the supplies requested should be purchased?

Should the functions of the purchasing agent include the employment of unskilled labor for all departments of the institution?

III. ADMINISTRATION OF THE COURSE OF STUDY:

1. *Entrance matters:*

How can the machinery of entrance and registration be reduced to a minimum and still retain its essential features?

2. *Relation of course of study to the purpose of the college:*

Fundamental principles of educational development in determining proper balance of the course of study between the strictly professional and the general cultural subjects.

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3. *Organization of courses:*

Should the organization rest with a sub-committee of the faculty, subject to the approval of the faculty, or subject to the approval of the heads of departments?

4. *Methods of teaching:*

Should the president or the heads of departments have power to decide the methods of conducting exercises; the relative time given to lecture work, recitation, laboratory, practicum, etc.?

5. *Tests of efficiency in teaching:*

What tests of efficiency in teaching can logically be applied?

How much value should be placed on (a) student opinion of the teaching; (b) a study of grades given by the instructor; (c) the opinion of the department head? What independent tests can be applied by the president or the dean?

IV. ADMINISTRATION OF STUDENT AFFAIRS:

1. *Relation of faculty to student affairs:*

On what basis can a plan of student advisers be developed satisfactorily?

Which is preferable (a) a system of student advisers; (b) an administrative officer giving his entire time to student questions?

2. *Scholarship:*

How can a sane attitude toward scholarship be created?

What machinery should be developed to maintain high scholarship?

What relation is the so-called "scientific grading" of students likely to bear to scholarship?

3. *Physical education and athletics:*

Should the institution have full control of athletics?

Should any but regularly employed members of the college staff be permitted to coach athletic teams?

4. *Student activities:*

To what extent should the institution supervise and regulate student activities?

To what extent should the institution consider itself responsible for the financial management of these activities?

Should all assessments levied by student and class organizations be subject to the approval of the faculty? Can the college require the payment of such assessments?

Can student activities be managed successfully on a budget basis?

What are the advantages and disadvantages of the "point system"?

What attitude should the institution take toward the approval of articles proposed for publication in student publications? Who should exercise such approval, if approval should be required?

5. *Discipline:*

To what extent can student self-government be relied upon to handle questions of discipline?

What authority in matters of discipline should be given to the military department?

In what, if any, matters of discipline should the trustees have supervision?

6. *Housing:*

What are the relative advantages of various facilities for housing, such as dormitories, private houses, fraternity houses?

What control should the institution exercise in each case?

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Are eating facilities best provided in large commons, private boarding houses, clubs, or fraternity houses? What plans may be adopted for furnishing food at various rates in college commons?

7. *Morals and religion:*

What can the institution do to improve the moral life of the students? the religious life? Is compulsory church attendance advisable?

How much time and money is a state institution justified in spending in ministering to the moral and religious welfare of its students?

8. *Personality and character records:*

Is it advisable to develop a plan of personality and character records?

How frequently should data for such records be compiled?

Should the system be continued after graduation?

9. *Expenses which are not officially required:*

To what extent shall an institution attempt to control the extra expenses connected with college activities?

10. *Relation of fraternities to social life and to scholarship:*

In what way can fraternities be utilized in developing the moral, religious, and social life of the college community and in improving scholarship?

11. *Leaves of absence to students:*

On what terms and with what restrictions should a student be permitted to absent himself from college, for a week, a month, a semester, or a year?

12. *Delinquency reports:*

How frequently should scholarship reports be made to the dean? In the case of delinquents, what action should be taken other than at the close of the term?

13. *Student employment:*

To what extent should the institution seek to furnish employment to needy students?

Should the assignment of such work be made on substantially the same basis as would a cash scholarship?

Should the institution attempt to place students in employment outside of the institution itself?

14. *The appointment bureau:*

General questions concerning management of such a bureau for the benefit of graduates of the institution.

V. RELATION OF INSTITUTION TO OTHER COLLEGES AND UNIVERSITIES:

1. *To other colleges and universities (with special section for the other agricultural and mechanical institutions):*

For the purpose of making fair comparisons, what type of reports, other than are now made, to the United States Department of Agriculture and United States Bureau of Education, might be gathered by some federal department?

Should there be formulated a code of ethics which would generally be accepted as a guide with respect to employing new men? If so, what points should be settled upon?

2. *To negro interests:*

In the states where negroes attend separate institutions, should there be any definite relationship or control between the institutions for the white people and the institutions for the negroes?

Should the two institutions be under the same board of control, or should, for instance, the head of the department of agriculture of the white institution be responsible for the agriculture taught at the negro institution?

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Should the two institutions conduct experimentation?

Should they conduct separate extension departments, or should all of the extension work for both white and colored population be in one department?

3. *To United States Department of Agriculture:*

4. *To United States War Department:*

5. *To United States Bureau of Education:*

6. *To state boards and commissions:*

What should the relationship between the institution and state boards whose work is closely allied to functions of the institution, such as state boards of agriculture, boards of cattle inspection, boards of dairying, boards of horticulture, etc.?

7. *To the state system of agricultural education:*

In what ways should the institution cooperate with the state system of agricultural education; in supervising agricultural instruction in special agricultural schools, regular high schools and elementary schools?

How should the boys' and girls' club work, organized and fostered by the colleges of agriculture, be correlated with the regular school work?

What correlation should exist between agricultural colleges and the school gardening work in public schools under state or local authorities?

8. *To the separate experiment station:*

9. *To voluntary organizations:*

What general types of voluntary organizations, private or public, can legitimately call upon the state college or university for assistance, either financial or otherwise?

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On motion, the report of the committee on college organization and policy was received.

THE PRESIDENT. The report of the committee on experiment station organization and policy will be presented by E. W. Allen of the Office of Experiment Stations.

REPORT OF COMMITTEE ON EXPERIMENT STATION ORGANIZATION AND POLICY

This report deals with the functions of the experiment stations in relation to various forms of regulatory activity. The fundamental idea upon which all our experiment stations rest is that of service to agriculture in acquiring accurate information, in place of tradition, conjecture, and empirical theory. They were a direct response to the need for knowledge resting on a reliable scientific basis, in order to make teaching sound and agriculture a more intelligent art. They represented the introduction of the experimental method in testing experience and theory, and securing reliable facts and principles in agriculture. They were to be stations for experiment.

But the great success of the station movement in this country has added to this primary function a variety of miscellaneous duties and responsibilities, until the modern station has become a complex and somewhat heterogeneous organization. Regulatory functions came to most of the stations early in their history. Indeed, some of them had their origin in control work. In the beginning experiments with fertilizers were a prominent feature, because commercial fertilizers were new and little was known about them. It was soon found their sale needed to be regulated by law, and as the experiment station people were almost the only ones available, the inspection quite naturally was assigned to those institutions. Gradually a great variety of regulatory and promotion work developed, very largely from the studies and agitation of the stations, and many of these have been turned over to their administration. They include the inspection of feeding stuffs, San José scale and nursery inspection, inspection of fungicides and insecticides, human foods, dairy apparatus, seed, paints, foul brood, animal diseases, etc. In addition, the stations are actively participating in the campaign for freeing territory from the cattle tick and other animal diseases, are manufacturing medicines or preventives for live stock, like serum, virus, etc., are conducting tests for advanced registry of dairy stock, supervising laws for stallion registration, and many

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other things. The extent and diverse character of these activities are evident

The stations have worked out the methods and the means for conducting these activities in an effective, just and reliable way. From the nature of their organization they have provided an ideal public service,—competent, reliable, free from contamination, and largely beyond political influence. These regulatory features have helped the stations to gain a firmer hold upon the public and win confidence, and have made them centers of activity for agricultural advancement. Some funds have come to them through these channels, which helped in the earlier stages of development.

But the station work and the inspection work now have won their way, and have an assured place in the system for agriculture in every state. The propaganda stages have passed. The various types of inspection and other regulatory service have been worked out, systematized, and standards set for them. Their execution has become largely a matter of routine, and they no longer have the same need for association with the stations they once had. Most of this work now can be carried on outside the stations nearly or quite as well as within, as experience in several states has demonstrated. There are plenty of trained persons competent to perform the routine duties. From the standpoint of revenue, the inspection work has become a relatively small item in the station budget. It amounted last year to less than $235,000, out of a total of over five millions. It carries with it an amount of interruption, distraction, and administrative attention which materially reduces the net financial return to the station.

The various agricultural activities of the colleges are now being differentiated and coordinated, to make them more specialized and effective; and agricultural institutions are developing outside the colleges. The extension work, which is a direct development of experiment station work and was born of its practical results and the public confidence won through it, has for some time been recognized as illogically grouped under the station and has been split off as a separate division or department. State laws have been modified to permit of the new organization.

Our classification of the activities for the benefit of agriculture is not yet complete. In addition to the three divisions of the agricultural college which we have begun to recognize in research, college teaching, and extension, we now recognize at least one other group which has to do with regulation—the machinery for the enforcement of laws for the protection or promotion of agriculture. This is not experimental, although the need for it and the methods for it often were developed by the experiment stations. They should continue to furnish information on which it is based. But logically it is just as much a part of the state governmental machinery as the enforcement of other laws and measures. The states should prepare to take care of it, and in many cases they are now in far better condition to do this than formerly. The retention of such measures by the agricultural colleges is retarding the formation of strong state departments of agriculture, which it is the interest of the colleges to promote.

Is there any more reason for making the experiment station a part of the governmental machinery of a state in the enforcement of these laws than there would be in entrusting to a college department of education the enforcement of any good education law which it had suggested? Or to the college of pharmacy the oversight of laws which it had urged? The assignment of regulatory functions to an educational institution is to be justified only on the grounds of temporary expediency. It diverts attention from the real work and purpose of the

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institution, and it often places the institution in a wrong attitude before the people. It is a confusion of government and education.

Our new organization of agricultural activities proceeds on the basis that there is advantage in concentration and coordination of effort. We recognize this advantage also in investigation. In response, there has been a general movement to relieve station men to a large extent from college teaching, institute work, management of farms and commercial operations, etc. We recognize also that the station work needs intelligent direction and supervision, and that the giving of these requires freedom from too many diverse interests. The field of the station in investigation and experiment is now immensely larger than it formerly was—there is so much more that is obvious and apparently pressing, and the questions are so much more complicated and difficult as we see them to-day. They demand the undivided attention and the best efforts of the station forces.

Viewed in the light of the present advanced position of agricultural work, there can be little question that the greatest field of usefulness of the experiment stations lies in advancing knowledge through sound systematic experiment and investigation. This will be needed alike by the college teaching departments and the extension departments to furnish a substantial basis for developing the industry and promoting greater intelligence in regard to it. The safe and efficient progress of the whole system for agriculture depends upon the experiment stations to a far greater extent than ever before. It is so vital to that progress that the stations should be given the encouragement of the research field and the opportunity for concentrated and undisturbed effort in it.

The experiment station has justified research in agriculture. It should be able to justify its own maintenance as a research institution. It is believed that at this time we may propagate with advantage to the whole agricultural system the conception of the experiment station as a research institution—one for discovering, verifying, and establishing the practical bearings of scientific facts and principles in agriculture.

In view of the importance of this subject and the desirability of discussion, it is hoped that it may be made a topic for consideration in a future meeting of the section on experiment station work.

Respectfully submitted,

E. DAVENPORT,
C. D. WOODS,
F. B. LINFIELD,
C. E. THORNE,
B. W. KILGORE,
E. W. ALLEN.

On motion, the report of the committee on experiment station organization and policy was received.

THE PRESIDENT. The report of the committee on extension organization and policy will be presented by Director C. W. Pugsley of Nebraska.

REPORT OF THE COMMITTEE ON EXTENSION ORGANIZATION AND POLICY

In the preparation of this report your committee met in conference with the Executive Committee of the Association and the States Relations Committee of the Federal Department at Columbus, Ohio, on April 29

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There were present: W. O. Thompson, Ohio; H. L. Russell, Wisconsin; J. L. Hills, Vermont; A. C. True, Washington, D. C.; C. B. Smith, Washington, D. C.; Bradford Knapp, Washington, D. C.; G. I. Christie, Indiana; W. D. Hurd, Massachusetts; Alva Agee, New Jersey; C. W. Pugsley, Nebraska. The discussions and the agreements reached at the meeting form the basis of this report.

Last year the committee presented a report containing descriptions and definitions of terms commonly used in connection with extension work. It felt that the lack of uniformity in the usage of terms relating to extension activities was detrimental to effective extension administration. The need of an accepted terminology became increasingly apparent in connection with the administration of Smith-Lever funds. It was the purpose of the committee to make last year's report the beginning of an effort looking toward the standardization of extension terms, and to devote the report presented this year in part to the definition of other terms in common use. However, an association committee on terminology was appointed at the last meeting and consequently this committee did not consider that the continuation of this special work lay within its province. It wishes, however, strongly to urge its importance.

Its report this year will deal with suggestions looking toward the standardization of those methods of administration which, in the minds of the committee and of those meeting with it, seem the most important.

PREPARATION OF EXTENSION WORKERS

No more important subject is likely to need the consideration of the extension administrators than that of training extension workers at the college and in the field. This committee was pleased to learn that several committees of this Association expect to report at this meeting on the subject of "training extension workers", and that several papers would be offered bearing thereon. This committee is concerned especially with the finished product rather than with the details of its making, in which, however, college executives, of course, are vitally interested. For that reason it urges each college as rapidly as possible to make some provision for the special training of students who expect to enter extension work. Not that it is necessary or advisable to introduce a large number of special extension courses. It is possible that such training courses might attract the wrong kind of men. The technical part of an agricultural education should not be diminished proportionately. Indeed, in many cases more valuable extension workers would be secured if more technical training were taken. There might be added, or possibly substituted for the less important courses, one or more courses dealing with methods of extension work. These courses might cover some of the following subjects:

1. Organization of extension work.

2. Methods of extension work. a. Special lectures. b. Movable school instruction. c. Demonstrations. d. Printed matter.

3. Preparation of material for extension instruction. a. For special lectures. b. For extension schools. c. For demonstrations. d. For printing.

Nearly all extension workers deliver lectures and make demonstrations. The adequacy of their preparation for such work may be enhanced if they are required while in college to prepare, under the direction of the heads of the departments concerned and of some the more experienced workers in extension service lines, a lecture or demonstration together with the illus-

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trative material needed to make it effective. If this work is done before the class and before members of the faculty and is criticized, the would-be extension worker should be benefited vastly by his experience and ought to be more likely to succeed in his actual field lecture and demonstration work. If his ultimate form of activity is to be field work, such as county agent work for example, it would seem worth while to place him at the outset in the field with some experienced extension man, and, later, to require him to carry out some project under the direction of extension workers and departmental heads. If the prospective extension worker expects to do county agent work, he should have had some practical farm experience in addition to his college education, and also should know how to meet the demands made on county agents.

One state is attempting to train its prospective county agents as follows: Juniors are selected with reference to their qualifications for the work and place during the vacation following their junior year with good county agents at salaries which will enable them to meet their expense accounts. The state leader and the county agents assign and direct their work. The experience thus gained should be of great value to them whether they do or do not enter upon county agent work. Juniors who have had such training, and promising seniors who aspire to become county agents, are assigned to counties as assistants at the close of their senior years, and kept there until such time as they may be assigned permanently. This scheme gives them training and employment until the first of the year when new counties usually are started, and, when they take charge of their new work, they have received practically a year's training under the direction of county agents and the state leader. The committee believes that some such plan for the training of prospective county agents has much merit.

PROJECTS

The committee feels that the framing and adoption of projects for the work of all extension representatives are very important. The project brings the working plans vividly before the minds of each representative and of those with whom he is associated. Unless a project is set forth clearly, it is possible that even the representative himself does not know just what he hopes to accomplish.

Three factors should be considered in framing projects for those extension representatives commonly known as county agents.

1. The relation of the work to the state as a whole.
2. The relation of the work to the region in which it is carried on.
3. The relation of the work to the locality where it is undertaken

Projects should be outlined, if possible, so that they will cover work for the entire year. Too many should not be formulated. It is better to complete a few lines of work than it is to start many and complete none. The county agent and those working with him should understand that when a project is once agreed upon it is entitled to first place in his activities. Unless this agreement is kept in mind constantly, less important things are apt to occupy his time and the project will be forgotten.

The committee also recommends that extension specialists in the various departments of the college and experiment station prepare projects of the demonstration work to be carried on in cooperation with the county agent or otherwise. There is crying need that the work of extension specialists be planned more definitely, to the end that their time may be conserved and their work be made more effective.

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Your committee also feels that each project should have the approval of all cooperating parties or of their authorised agents, and that each project should be discussed and approved by the board of directors of the county association or farm bureau in the presence of the county agent and of the state leader or his representative.

COUNTY ORGANIZATION

County associations of farmers to cooperate with the county agents are most desirable, indeed necessary, and the more responsibility they bear the more effective will be the agent's work. Under no circumstances should the latter handle association funds. If money is needed in carrying out a given project, it should be handled by the proper officers of the county association or of some other organization, or by the farmers themselves. Serious complications are likely to develop if the county agent acts as financial agent. He may, however assist in the organization and education of farmers to handle their own finances. Such work is educational in its character and is a legitimate phase of a county agent's work.

DIRECTION OF COUNTY AGENT

Because of existing organizations and relationships, the county agent should be a representative of the agricultural college, of the United States Department of Agriculture, and of other cooperating parties; but the agricultural college should select the agent with the approval of cooperating agencies, and always should direct his efforts. His work, while directed by the college, may be initiated either by the college, the Federal Department, the agent, or by the association with which he is working; but the nature and scope of his activities should be agreed to by all cooperating parties.

EXTENSION PUBLICATIONS

The issuance of a series of extension publications by the college of agriculture is very desirable. College publications seem naturally to be of three classes, college, station and extension. The college publications should deal with the home instructional work and with general college interests; the station publications should set forth the results secured in research and regulatory work; and the extension publications should purvey informational matter touching agriculture and home economics to the non-resident college constituency.

Extension publications may be compiled from research materisl which has been substantiated by practical application as well as from the records of practical experience. They should be so phrased as to be capable of imparting information to those unfamiliar with the technical language of the subject under discussion. They should be concise, definite and free from unnecessary detail. They should consist of conclusions and summaries rather than of expositions of methods whereby conclusions were reached. They may be issued as bulletins or may include, also, circulars, leaflets, or press bulletins, short, concise statements intended to meet emergencies or to attract special attention. At times it may seem desirable to reprint publications of other colleges, which contain exactly the material needed. Such a procedure saves time in preparation and expensive duplication of effort. Naturally in such cases permission will be secured and credit given.

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MAILING LIST

Extension mailing lists are growing rapidly and much labor is involved in keeping them up to date, so that the material published will not be wasted. The extension directors have now to wrestle with the same problem which the station directors have dealt with in the past with this added difficulty, that the extension mailing lists as a rule are becoming much larger than are the station mailing lists. In one state the formal mailing list had been done away with entirely. Whenever an extension publication is issued notices announcing the fact appear in the local papers, and the publication is sent only to those making special request for it. It would seem as if this plan might obviate waste, since only those who are really interested in it receive the bulletin or circular. Many bulletins could be distributed through county agents and other field extension workers at special meetings, etc., but such a scheme of distribution requires careful supervision lest waste occur.

FOLLOW-UP WORK

The committee strongly urges that some system of follow-up work be established in connection with all extension work. The holding of movable schools and special meetings is good; but much more good can be accomplished if some attempt is made to secure the general practise of the methods which are advised. Field specialists and county agents should employ a system of follow-up work in connection with all of their projects. Such systems tend to bring to light the weakness of the working plan, if any there be, and should result in the establishment of much more effective methods. Extension teaching is useless if advocated methods are not practiced. There is only one way to determine the result of such work, and that is to follow it up in the field.

SUMMARY REPORTS

The committee thoroughly believes in the value of summary reports. These should be required of all extension workers at least once a year. In no other way can there be brought so vividly before the workers the successes and failures of the year's work. Such reports are of great value to extension directors and college authorities in extension work.

RELATIONS WITH UNITED STATES DEPARTMENT OF AGRICULTURE

Inasmuch as instances have been reported to this committee where the cooperative relationships set forth in the general memorandum of understanding existing between the States Relations Service, representing the United States Department of Agriculture, and the several state colleges do not seem to have been adhered to in spirit, the committee suggests that extension directors and other college officers report to the Executive Committee of this Association, or to some other central body to be designated by the Association, any data which may bear on this matter, in order that complaints or misunderstandings may be promptly and effectively dealt with and the general policy maintained.

Respectfully submitted.

W. D. HURD,
G. I. CHRISTIE,
H. L. RUSSELL,
W. R. DODSON,
ALVA AGEE,
C. W. PUGSLEY,
Chairman.

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On motion, the report of the committee on extension organization and policy was received.

A. V. STORM. Would it not be well if the standing committee reports were printed and distributed in advance of the annual meeting? Believing that such a procedure would be desirable, I offer the following resolution:

"Resolved, That the Executive Committee be authorized to print separates of the reports of the standing committees in advance of the annual meeting when in its judgment the value of the early printing of such reports would justify the additional expenditure."

THE PRESIDENT. This resolution is referred to the Executive Committee for consideration.

The chair calls attention to the report of the Executive Committee concerning the Constitution and proposed constitutional amendments (item 6, pages 22-30) and suggests that if further action in connection with this matter is desired at this Convention, the proper resolution be introduced promptly so that it may be assigned a place on the program and be properly discussed.

On motion, a recess was taken until 9 o'clock A. M., Friday, Aug. 13.

MORNING SESSION, FRIDAY, AUG. 13, 1915

The Convention was called to order at 9 o'clock A.M. by President Bryan.

THE PRESIDENT. "The Correlation of the Colleges of Agriculture with Other Institutions" will be discussed by Prof. A. Vivian of Ohio.

THE CORRELATION OF THE COLLEGE OF AGRICULTURE WITH THE OTHER COLLEGES OF THE STATE

BY A. VIVIAN

The college or university of the past has been a self centered institution, not admitting its accountability to anyone without its walls, or, at most, beyond the church which was responsible for its support. There has been an unfortunate lack of comradeship among the colleges and an equally unfortunate spirit of jealousy and suspicion. This perhaps, is not surprising when it is remembered that the first colleges and universities in the country were established by the different denominations of the Christian church, at a time when minor differences of creed were more emphasized than they are at the present day. It is not strange that the later endowed colleges and universities, which were not strictly denominational, in like manner should feel that they were self sufficient, and that they were accountable to no one but themselves for the courses of study and general conduct of the institution.

The establishment of the state universities and the colleges of agriculture and mechanic arts introduced a new factor and gave the preeminently American touch to the national scheme of education. The men who first conceived the idea of these institutions of learning supported by state and national funds had no thought of supplanting the existing colleges. These new institutions were rather to supplement those colleges and to provide that kind of higher education and technical instruction which evidently was beyond the means and outside the scope of the small college.

In the beginning the privately maintained colleges looked with suspicion upon the movement, and were rather generally opposed to the use of public funds for the support of this new type of educational institution. They felt

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afraid that they would not be able to hold their own with a university that had the public treasury back of it, and that the development of the state supported college and university might sound the death knell of the smaller college. The state institutions, on the other hand, feeling this opposition on the part of the other colleges, and, perhaps, being moved by the feeling always harbored by the promoters of a new venture toward a well established enterprise in their own line, assumed the same self sufficient and self centered attitude that characterized the earlier institutions. The result was that only in very recent years has there been any attempt to cultivate the feeling of cooperation and comradeship which is the proper spirit to dominate our colleges and universities, and which should exist especially between the state supported institutions and smaller colleges. That the increase in attendance at the state universities has been coincident with a very large increase in enrollment in the other colleges is one of the interesting facts of recent educational history.

The combined arts-agriculture courses put in operation through the cooperative efforts of the College of Agriculture of the Ohio State University and the other colleges of Ohio were born of a sincere desire on the part of these institutions to be of greater service to the public. These courses, perhaps, in part are due also to the fact that their promotors had read the signs of the times and realized that in the future the colleges and universities would be held less and less to their own accountability, but would be held answerable to the citizens they are supposed to serve. The popular demand is for efficiency, in education as well as in other lines, and the public has its own criteria of efficiency which, sooner or later, it will surely impose upon the colleges whether they will or no.

Anyone acquainted with the history of education in Ohio realizes that enough cannot be said in praise of the work which has been done by its small denominational colleges. Hardly a state in the Union but counts among its educators and often citizens men whose success and usefulness are in a large measure due to the training obtained in one of Ohio's numerous colleges. The small college has made a collegiate education possible to hundreds of men and women who never would have been able to attend a state university or one of the larger educational institutions. The desire to see the smaller college continue to prosper and to increase in efficiency is one of the prime motives back of the present movement toward cooperation between the College of Agriculture and the other colleges.

The tendency of the times is toward technical education. The public is demanding that a college education shall lead definitely to preparation for the life-work of the student. If this demand is not anticipated in a rational way by the colleges, there is danger that an exasperated public may take the matter into its own hands, and, in its eagerness for reform, abolish the good as well as the evil in the present system of education. Technical education of all kinds, and especially agricultural education, calls for expensive equipment, and unless the state institution and the small college are willing to cooperate, it means that the smaller institution must see students who naturally would come to it, pass by to the state university, or be forced to attempt to retain these students by pretending to offer courses for which it has neither adequate instructional force nor equipment. Many of the smaller colleges are prepared to do excellent work in the usual arts and science subjects. Many of them have splendid teachers whose devotion to the student and college has been demonstrated by the great financial sacrifice they have made to remain in the college where they thought the opportunity was greatest to work for the educational and moral uplift of the rising generation. But it is out of the question to

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expect these colleges to undertake to give high class instruction in the technical and professional branches.

The arts-agriculture courses referred to in this paper are the direct result of the county extension schools, or, at least, their adoption has been stimulated by them. Several of the extension schools were held in college towns and some of the instructors were invited to address the college convocations. Following this the College of Agriculture received letters asking for an outline of the subjects for which credit could be transferred from the Arts College, and which would permit the student to complete the course in agriculture in two years. A number of students lately have entered the College of Agriculture who in this way have been able to transfer sufficient credit from their home college to enable them to graduate in agriculture in two years.

In 1913 the College of Arts, Philosophy and Science and the College of Agriculture of Ohio State University adopted a five-year combined arts-agriculture course, which gives the Bachelor of Arts degree at the end of the fourth year, and the Bachelor of Science in Agriculture degree at the close of the fifth year. This course, with minor differences in the work of the first three years, now has been adopted by joint action of the College of Agriculture and ten other colleges in Ohio. The outline of the course as adopted by the College of Agriculture and one of the smaller colleges is given below:

THE THREE YEARS' REQUIRED WORK AT——COLLEGE

Freshman Year

First Semester		Second Semester	
English	4 hours	English	4 hours
Mathematics	4 hours	Mathematics	4 hours
Modern language	4 hours	Modern language	4 hours
Chemistry	4 hours	Chemistry	4 hours

Sophomore Year

English	2 or 3 hours	English	2 or 3 hours
Modern language	4 hours	Modern language	4 hours
Botany	4 hours	Botany	4 hours
Zoology	4 hours	Zoology	4 hours
Mechanical drawing	2 hours	Mechanical drawing	2 hours

Junior Year

Economics	3 hours	Economics	3 hours
Physics	4 hours	Physics	4 hours
Geology	3 hours	Geology	3 hours
American history	3 hours	American history	3 hours
Elective	3 or 4 hours	Elective	3 or 4 hours

THE TWO YEARS' REQUIRED WORK AT OHIO STATE UNIVERSITY

Senior Year

Animal husbandry	4 hours	Choice of any two of these subjects throughout the fourth year; the remaining two the fifth year.
Agricultural chemistry	4 hours	
Rural economics	4 hours	
Agronomy	4 hours	

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In addition to the two subjects elected, ten hours a semester to be selected with approval of adviser.

Post Senior Year

Two subjects of the four mentioned in senior year (8 hours a semester) and ten hours throughout the year, from any of the courses related to the previous year's work in the College of Agriculture.

According to this plan the student spends the first three years at the home college and the last two at the College of Agriculture. At the end of the fourth year, if his work in the College of Agriculture has been satisfactory, he is given the Bachelor of Arts or Bachelor of Science degree by his home college, and at the close of the fifth year he receives the degree of Bachelor of Science in Agriculture from the Ohio State University.

Some of these colleges, which have adopted the arts-agriculture course also have adopted a similar course in arts home economics. This year Ohio State University adopted an arts horticulture course which has not yet been presented to the other state colleges. While none of these courses have been in operation for more than two years, it was possible for some students to meet the requirements of the first three years of art work, and, consequently, there are now students in the College of Agriculture who are taking advantage of these combined courses. The students coming to the College of Agriculture from the other colleges nearly always are earnest students, who have a very definite idea of that toward which they are working, and who make an excellent showing in the class room.

The College of Agriculture would much prefer having the students complete the four years' work and obtain the degree from the Arts College before taking up the work in agriculture, but the tendency of the times apparently is toward shortening the time devoted to school work and an earlier entrance into life work. The five-year combined course is a compromise between the more ideal arrangement of four years in arts and two in agriculture and the present four-year agricultural course, which allows so little fundamental training in general science and the humanities.

The advantages of such a five-year combined course may be summarized briefly from three standpoints; (1) of the College of Agriculture; (2) of the cooperating Arts College; (3) of the student.

Advantages to the College of Agriculture. The students coming from these courses are more mature and need less supervision than the average freshman entering the regular four-year course in agriculture. They also have better fundamental training, thanks to the extra year. The university is relieved of the elementary instruction of the first and second years, which is especially important in subjects calling for laboratory work, as practically none of the state institutions are able to provide laboratory facilities to keep pace with the increase in enrollment. Being relieved of part of the elementary instruction, the College of Agriculture puts more of its income into the technical work of the junior and senior years, where it will accomplish most for the cause of agricultural education.

Advantages to the Cooperating Arts College. The combined course enables the college to retain students who otherwise would go directly to the College of Agriculture. It retains these students as alumni of the college, who are even more devoted to the college than those who graduate in the ordinary way, for they feel that they owe an added loyalty to their Alma Mater because of the concessions she has made to them. The denominational college has three of the most vital years of the young man's life in

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which to impress upon him the religious beliefs for which it stands, both by its teachings and by the personal example of its earnest teachers. This point cannot be emphasized too strongly. The combined course stimulates both institutions and results in improvement of the character and quality of the work of each. The college, knowing that its students are to work side by side in the College of Agriculture with those from other colleges, naturally will strive to make its work at least equal to the best of its sister institutions.

Advantages to the Student. The combined course gives him a better general preparation than he would receive if he took the usual course in agriculture. It enables him to take his fundamental work in small classes where he benefits by that personal contact with the teacher, which is so lamentably lacking in state institutions with their large classes and inadequate number of instructors. His association with the teacher outside the classroom is such as is impossible in a large institution, and the personal friendship and example of the teacher is of incalculable value to the young man in his earlier years in college. The student comes to the College of Agriculture with more maturity, and is better able to adjust himself to university conditions than is the boy just out of high school. He has had the advantage of that religious instruction which he will count one of his greatest assets in later life, and he is able better to cope with the temptations which he often meets for the first time when away from home attending college, especially in the larger institutions where supervision of the intimate life of the student is impossible. The combined course makes it possible in many instances for students who are interested in agriculture to spend three years more at home under parental influence and discipline, and the best information obtainable indicates that the five years taken in this way costs the student decidedly less than four years spent at the College of Agriculture. The small college arouses in the student that fine college spirit which is so lacking in the large state universities, and which is an asset to both college and the student. It is to be hoped that he will bring that spirit of enthusiasm, loyalty and earnest purpose with him to the College of Agriculture. The combined courses already have shown that they will result in many students devoting five years to college work who otherwise would spend only four years in college, and could not have been induced to devote six years to undergraduate college work. It is interesting also to note that these students who already have spent five years in college are the ones most easily interested in graduate work.

In conclusion, the Ohio State University feels that the school system of the State should be a unit, and that there is a place for the college between the high school and the real university or the technical and professional college. It feels that it is the function of the state university to supplement the colleges by providing facilities for graduate work and for training in those technical and professional lines which call for equipment which is beyond the means of the smaller colleges. It recognizes its responsibility and obligation to all the citizens of Ohio. It looks forward to the time when there shall be the heartiest and most far-reaching cooperation among all her institutions of learning, a feeling with which, it has reason to believe, many of the colleges sympathize. The combined course is an evidence of the desire on the part of these colleges to be of greater service to the public.

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THE PRESIDENT. The next paper, "The Place of Mechanic Arts and Engineering in the Land-Grant Colleges", will be read by President R. A. Pearson of Iowa.

THE PLACE OF MECHANIC ARTS IN LAND-GRANT INSTITUTIONS

BY R. A. PEARSON

When one reads the first Morrill Act of 1862 and succeeding federal acts which relate to the service of the land-grant institutions, and when he considers the meaning of the term "mechanic arts" in the days when this term was included in federal legislation, and when he investigates the character of work done at leading institutions for many years throughout this country under authority of this term in federal law, and the direct and indirect approval of work of this kind by those who would have authority to change it or stop it, it seems to the speaker that such a person could come to but one conclusion, namely: that the work is well begun along proper lines and there is an obligation upon every institution entrusted with such work to develop it according to the words and spirit of the fundamental law, which would mean according to the needs of the present time.

The laws establishing and governing land-grant institutions provide specifically for teaching subjects related to agriculture and the mechanic arts. These terms are equal in the law. Neither one is made subsidiary to the other. Senator Morrill realized that the constructive development of this country depended upon the development of its industries. The natural resources, with values beyond estimation, needed to be made useful and this meant the development of farming, mining, manufacturing and transportation. Senator Morrill intended to provide for such developments in a manner that would be both efficient and honorable. His chief agency would be education.

Until the passage of the Morrill Act, science applied to practice had poor standing in the field of education. This legislation has placed applied science, in the form of agriculture and engineering, upon a level with other vocations longer recognized and open only to a comparatively few. This legislation has made it possible for many leaders in agriculture and engineering, which is a modern term for mechanic arts, to stand on a level with the few leaders in other older professions. It is one of the great influences which has served to prevent the development of an aristocracy and a peasantry in this new country. The thought that Senator Morrill or Congress intended any limitation upon the science standards, or scope of usefulness, or the dignity of agriculture or engineering as a profession, is repugnant.

It has been claimed that the term "mechanic arts" means work of the trade school kind, or agricultural mechanics, or some other such limited field. This Association has passed upon the subject and has declared itself clearly; but the question continues to be raised and it may be profitable to discuss it further because it means much, perhaps everything, to the land-grant institutions from the standpoint of their interests in agriculture as well as engineering. If it is shown that the term "mechanic arts" means work of low or inferior grade in the field of engineering as that term is used today, then probably it will be an easy matter to show that land-grant institutions are expected also to give only secondary, or popular, work in agriculture, for the two great subjects are treated in the same manner in the law. Such a construction would not harm the land-grant institutions nor the men connected with them so much as it would harm the greatest industries of this country, particularly

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agriculture. It would affect agriculture by curtailing the preparation of men to fill important scientific positions. It would affect the industry still more by carrying the idea that it is inferior, that education in agriculture is of lower grade than education in law, for example. This might be acceptable to the young men in European countries but not to American young men, the brightest and most competent of whom are needed in our industries, but who would be drawn away from them into the old professions if the educational requirements of the latter are to be considered superior to those of the former. Experience has shown that in agricultural education the American people want the best. The enrollment in agricultural courses has increased when entrance requirements have been raised to the same level as entrance requirements of other courses.

To substantiate the claim that the term "mechanic arts", as used in federal legislation, requires and justifies high grade work in engineering in the land-grant colleges, brief references will be made to this question from three standpoints, namely: first, the meaning of the term when the law was passed; second, the requirements of the law; third, the custom that has developed under the law.

1. THE MEANING OF THE TERM WHEN THE LAW WAS PASSED

Meanings of words do not always remain the same. Many words are used in a different sense now than twenty-five years ago. One of these is the word "engineer". The term "mechanic arts", as improperly used today by some people, also means something different than in 1862, when it was incorporated in the law. If Senator Morrill really intended that work in mechanic arts or engineering in land-grant institutions should represent the highest and best, and that these institutions should help to train leaders, then in his day it would have been a mistake to have used the term "engineer" or "engineering", and it was right to use the term "mechanic arts", as a study of the dictionaries of that time readily will show.

Worcester's dictionary of 1855 states that an engineer is "one who constructs engines and cannons"; and a civil engineer is "one who constructs canals, docks, railroads, etc." The same dictionary, dated 1860, under "engineer" refers to (1) military engineer; (2) maker of engines; (3) one who manages a steam engine. In a note it adds that a civil engineer is "one who constructs canals, railroads, docks, harbors, etc,"

Webster's dictionary in 1862, under "engineer" defines "military engineer" and adds that engineers also are employed in delineating plans and superintending construction of other public works, as aqueducts and canals, the latter being called civil engineers. This is enough to show that if Senator Morrill had used the term "engineering", he would have placed this work in the land-grant colleges largely on a military basis, and beyond that a very narrow field in modern engineering would have been included.

Worcester's dictionaries of 1855, 1860 and 1886, under "art", refer to the fine arts and to useful or mechanical arts.

Webster's dictionary of 1862, under "art", states that the ancients divided the arts into the liberal arts * * * and the servile arts, which comprised the mechanic arts and were practised by slaves. The moderns (of 1862) divided the arts into the fine arts * * * and the useful or mechanical; those arts in which the hands are more concerned than the mind are called the trades.

Yet there are prominent people today who are trying to make it appear that the term "mechanic arts" in the law should be interpreted to mean trades,

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though it was so clearly shown in the dictionary of that time that a much broader and higher meaning was correct. If Senator Morrill had intended his law to limit the arts to those in which the hands were more concerned than the mind, doubtless he would have used the word "trades".

The Encyclopedia Britannica of 1797 states that engineer means strictly a military expert.

The Encyclopedia Britannica of 1857 states that mechanics, applicate or applied, is a term which, strictly speaking, includes all applications of the principles of abstract mechanics to human art. The article continues "thus have theory and practice in all ages promoted each others advance; and the greatest obstacle to the advancement of both has always been a popular and scholastic fallacy that they are inconsistent. Happily that fallacy is now disappearing and its occurance in the writings of any author may be considered as a mark either of ignorance or of the inconsiderate use of words".

More definitions which were authoritative when the Morrill Act was passed might be included to emphasize further that it was then right to use the words "mechanic arts" to provide for such work as now would be covered by the term "engineering".

2. THE REQUIREMENTS OF THE LAW

The law has been criticised because it was not more clear, but it is difficult to indicate wherein it could be made more clear. It is well known to lawmakers that too many details should not be included in a law that relates to a new and developing problem. But aside from the use of the term "mechanic arts," the law includes other words and phrases which show the intention to include work of high standard. For example, the law calls for the establishment of a college for teaching subjects relating to agriculture and mechanic arts, and provides that other scientific and classical studies may be included. In those days the word "college" meant the highest and best in the educational field, and classical subjects represented the highest and best that a college could teach. It was in such an institution and with such associations that mechanic arts were to be developed. The law requires the work to be given in a manner to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life. In this section then we have the clear inference that agriculture and mechanic arts were to be regarded as either scientific or classical and that the education was to be of a liberal character and related to the professions. Some persons attempt to make much of the reference to education of the industrial classes, but any effort to show that the education of industrial people should be of low or secondary grade would not be popular in this country. Too many of the leading authorities in America have come from the industrial classes.

Section five calls for an annual report recording "improvements and experiments" and "industrial and economic statistics". Such requirements do not accompany work exclusively of a trade school or handicraft grade. They do indicate strongly, however, a purpose to maintain investigational work in connection with instruction.

But whatever may be said about the institutions not developing their work as intended by the original law, it must be admitted that repeatedly the work of the institutions, as it was being developed, received endorsement and further support from Congress, which was the strongest indication that such work was approved.

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In 1890 the benefits of the law were well known and widely known. In different land-grant institutions engineering instruction of the highest grade had been established and was attracting wide attention. Congress showed its approval of this development by enacting another law providing for "a more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts", etc. This was the highest endorsement Congress could give to the work of the institutions as developed under the original Act of 1862. There are numerous passages in the Morrill Act of 1890 which indicate that the institutions were expected to carry on advanced work.

In 1907 Congress gave further approval through the Nelson amendment "for the more complete endowment and maintenance of agricultural colleges now established in accordance with the Acts of 1862". This amendment definitely states that it refers to agricultural colleges as defined in the Act of 1862, which shows the approval of the work being done both in agriculture and mechanic arts.

In 1883 it was deemed necessary to amend the original Morrill Act, and a change was made in section four, where the general character of work to be done was defined. It must be that Congress then was well satisfied with the character of instruction being given in the land-grant institutions, for care was taken not to change the parts of section four which most directly and clearly refer to work of high grade. Such expressions as "scientific and classical studies" and "liberal and practical education" and "pursuits and professions in life" were not changed. On the other hand they are further emphasized by being reproduced in the amendment. It is well known that in 1883, when this endorsement was given by Congress, some of the land-grant institutions were doing notable work of the highest grade along engineering lines. Many of them were doing advanced work of a highly creditable nature, all under authority of this Act.

Furthermore, under provisions of the law, certain rulings and instructions may be issued by federal authorities from time to time in connection with the enforcement of the law. Under this authority, the Commissioner of Education has called attention to the fact that instruction in mechanic arts may be reported under the following classifications of subjects:

Mechanical engineering	Architecture
Civil engineering	Machine design
Electrical engineering	Mechanical drawing
Irrigation engineering	Ceramics
Mining engineering	Stenography
Marine engineering	Typewriting
Railway engineering	Telegraphy
Experimental engineering	Printing
Textile industry	Shopwork

The writer of this paper fails to understand how any one who has studied the Morrill Act can make the claim that it was not, or is not, intended to support engineering instruction and investigation of all grades.

3. THE CUSTOM THAT HAS DEVELOPED UNDER THE LAW

Even though it be a slight repetition, it should be pointed out here that immediately after the passage of the Morrill Act in 1862, plans were laid for giving the highest grade of instruction along the lines of mechanic arts, under

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provisions of the new law, at the Massachusetts Institute of Technology and at Cornell University, and doubtless at numerous other institutions. Under the direction of General Francis Walker and President Andrew D. White, the custom was established immediately of interpreting the law to provide for, not trade school or other low grade work, but for instruction of the highest character that could be given. These great institutions were developed year after year along these lines, but always under the authority of the Morrill Act.

That the same custom was general is shown by an official report upon "Technological Instruction in the Land-Grant Colleges", by Wellford Addis (page 1189 of the report of the United States Commissioner of Education for the year 1894-5). This report, which is written by a specialist of the United States Bureau of Education, evidently follows a thorough study of the subject. The author states (page 1191) that "these schools have never been anything else but schools of agriculture and mechanical engineering. The trade schools of Europe,—the school for the common people, the caste school, the school for the 'industrial classes,'—has no, or next to no, following in America." And, further, he well says on the same page, "the first want felt in the establishment of this class of schools was the education of men of science to man them, but the first purpose for which they were established was the instruction of able, educated, trustworthy technologists, such as well informed engineers, architects, mechanicians, manufacturers, miners, agriculturists, and the like, for which the country was at that time loudly calling. * * * It was safe to say at the date of 1871 in all the institutions enjoying the benefit of the Act of 1862, the second or technological need was being met. * * * There was one or more in which the presence of the post-graduate course indicated a desire to supply men of science."

We do not find any precedent or custom of importance in opposition to those cited.

If the land-grant institutions are to serve the needs of the present time in reference to mechanic arts, as that word was defined in 1862, or engineering, which, to many, means the same today, the scope of work should expand as the needs expand. In the field of agriculture, three great lines of development are recognized,—teaching at the college, investigation, and extension. The time is ripe for similar developments in the engineering departments. College teaching in engineering has been raised to a high point of efficiency; improvements have been made constantly since land-grant institutions were started, and will continue to be made. Beginnings have been made in engineering experiment station work, and engineering extension work. There is great need for developments along these lines, parallel to similar work in agriculture.

Because of ignorance concerning coal, gas engines, power transmission, waste of energy, storage of energy and many other subjects, the public is losing values which are enormous, even compared with the large values that we are accustomed to deal with. The development of this country has gone far enough now so that we can afford to become efficient, in fact, we cannot afford to be inefficient. This means investigation and experimentation, and a few dollars expended in this way practically are certain to yield returns many times as large as the expenditure. One engineering experiment station, at almost trivial cost, has developed facts in connection with clay tile that are of enormous benefit to all who make or use this very important article. It has shown the real value of coal mined in its state, so that this coal now is being used to advantage by consumers who previously considered it necessary to

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ship coal from distant points in other states. These are two of a number of benefits that could be mentioned.

Engineering extension, like agricultural extension, is intended to reach the multitudes throughout the country, who, too often, have no other way to get the information which they need in their daily work. This country is notoriously backward in its industrial training for young people. Engineering extension helps to overcome this great defect in our educational system. It reaches classes of young men who are ambitious to advance and who thus will become better citizens, and gives them what the schools fail to give them. And it offers to all persons the well digested knowledge of recent development in the laboratory and in shops and private practice. The time may come when public schools more fully will meet this need in engineering and in agriculture; until then it is an e lucational crime to neglect this kind of work. It is fundamental to the development of industries which will be able to compete with those of other countries where vocational education is well developed. It is a means of increasing the efficiency of young men in cities, towns, and country, and helping in many cases to make their lives useful instead of indifferent, or worse. Engineering extension has been started well in a few states; it is still feeling its way, but it has developed far enough to prove its value and necessity. This work is carried on in various ways; by correspondence, short courses of a week, night schools, and term courses. In the main it is not college grade of work, but in the absence of any more definite policy in connection with public education, it necessarily falls to the colleges to initiate the work and take full charge of it, at least temporarily. They are best fitted to study the field, make experiments and establish policies. When this has been done and the value of the work has been proven thoroughly, the colleges should be, and doubtless will be relieved in large part of the necessity of work along this line. But there always will be important work of this kind for colleges to do as they can command the services of experts beyond the reach of local schools.

As a summary, the place of mechanic arts in the land-grant institutions, as provided by law, is on the same plane as the place of agriculture. Work in mechanic arts should be developed to meet the requirements of the public, and these now include work along three lines, namely: college teaching, investigation and extension.

THE PRESIDENT. "The Relation of the United States Bureau of Education to the Colleges of Agriculture and Mechanic Arts" will be reviewed by Doctor S. P. Capen, whom we are glad to welcome as the higher educational expert of the Federal Bureau of Education.

THE RELATION OF THE BUREAU OF EDUCATION TO THE AGRICULTURAL COLLEGES

BY S. P. CAPEN

I appreciate the honor you have done me in asking me to bring you the annual greetings of the Bureau of Education. The invitation comes almost like an answer to prayer, because for some time I have been particularly eager to make the acquaintance of your Association as an association; as individuals I know many of you already. Moreover, I have a proposal and a request to bring before you. I can see how you might have been served better, certainly more edifyingly addressed, by any one of the several other members

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of the Bureau. While the division of which I have charge is the one to which your institutions report, I have been obliged to leave the consideration of the technical phases of this work to others. The field of higher education is broad. The division in some fashion must render an account annually of all important activities in it. It can handle in detail only those that press most insistently for treatment. In the year and a half that I have been in office this pressure has come with great force from other directions. I can say without shame, therefore, that I have not been able to familiarize myself as much as I should like with the special problems of the land-grant colleges as a distinct, closely organized, self-conscious group of higher institutions. Individual land-grant colleges and their peculiar local relations, opportunities and difficulties I feel that I know pretty well, but I know them not so much as national, rather as state institutions. This is another reason why I welcome the chance to come before you and learn by first-hand contact something more of the spirit and purposes of your Association.

You have asked me to discuss the relation of the Bureau of Education to the agricultural colleges. There has been for a long time a definite legal relation, somewhat mechanical. Of late years this has been maintained on the part of the Bureau by the Specialist in Land-Grant College Statistics acting under the Commissioner of Education. Most of you are perfectly familiar with it, yet in order to make my account complete, I have asked Mr. Andrews, the present Specialist in Land-Grant College Statistics, to give me a statement, which I summarize. There are, I believe, other possible if not actual relations. These have become increasingly evident to me as I have read the proceedings of your meetings for the last six or seven years. I should like to discuss them also before I finish.

The Bureau stands in a definite statutory relation to land-grant colleges as a result of various acts of Congress and of agreements between the Secretary of Agriculture and the Secretary of the Interior. In accordance with these the Commissioner of Education is charged with the administration of the land-grant funds provided by the Acts of 1862 and 1890. He must collect from each institution annual reports concerning the expenditures of the funds and transmit these to the Secretary of the Interior with a statement as to whether or not each institution has complied with the terms of the acts. The Secretary of the Interior certifies to the Secretary of the Treasury every institution which has so complied to be entitled to the next year's installment of the federal appropriation.

Until three years ago this supervisory function of the Bureau did not extend to the expenditures of the principal and interest of the land-grant fund of 1862. The first Morrill Act, to be sure, required the rendering of an annual report to the Secretary of the Interior concerning the disposition of the fund, but it provided for no central administration and fixed no penalty for violations of the terms of gift. For fifty years this grant was in practice administered by each state as it chose. On June 21st, 1912, however, the Acting Secretary of the Interior directed the Commissioner of Education to proceed at once to require from all land-grant colleges reports regarding the principal and interest of the land-grant fund of 1862. He further ruled that the act of 1890 was supplementary to the act of 1862. The authority thus is given the Commissioner of Education to penalize any institution for failures to correct, as far as possible, violations of the act of 1862 by withholding its share of the annual appropriation made under the later acts. This penalty as yet has not been imposed. Nevertheless, the terms of the original act have been violated consistently in several states and in some

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the very records of the fund are so confused and obscure that it is impossible to tell what its present condition is. The Specialist in Land-Grant College Statistics has been spending a portion of the past year in an effort to trace the disposition of the 1862 fund in each state. When this work has been completed, present and future violations of the terms of the act may be corrected easily by the institution involved.

In addition to auditing these reports, the Bureau of Education, through the Commissioner, makes all rulings regarding the interpretation of the acts and the expenditures which may be allowed under them. In this matter it has taken the consistent position that, as far as possible, the states themselves should determine the most appropriate distribution of the funds to meet their respective local needs, provided only that the specific requirements of the acts are complied with. For instance, the Bureau never has held that a definite proportion of the Morrill fund should be spent for agriculture. So long as a college maintains a satisfactory department of agriculture and does not spend the fund otherwise in contravention of the terms of the acts no objections are raised. The Bureau merely has specified certain subjects (agriculture, mechanic arts, English language, mathematical science, natural and physical sciences, economic science and special preparation of teachers) for the teaching of all or part of which the funds may be used. It has not hesitated to disallow expenditures for salaries of persons teaching other subjects or of persons appointed to teach one of the approved subjects but found incompetent for the work. This last contingency rarely if ever has arisen except in the land-grant colleges for negroes.

Through the annual reports rendered by the land-grant colleges, which are more detailed than those made by other institutions, the Bureau is put in possession of important statistical information regarding these colleges. This for some years has been compiled separately and published in a separate chapter of the annual report of the Commissioner as well as in connection with the general statistics of higher education.

This, I think, briefly summarizes the Bureau statutory relations to the land-grant colleges acting as the organ of the Department of the Interior. It is clothed with a certain measure of administrative authority over them which it does not wield over any other higher institution. In fact it is a sort of subsidiary board of trustees with strictly limited powers. It has worked mostly at long range and through written reports. It has exercised only rarely and in a rather perfunctory way the right of visit and search, a right which was conceded to it in 1911. That the Bureau should be placed in a position to do this more thoroughly is very desirable, not for the purpose of prying into the affairs of the land-grant institutions and displaying its small authority arbitrarily, nor because it cannot rely on the colleges to make accurate reports, but rather in order that it may perform the service which the bees render flowers: that it may carry the fertilizing pollen of their several experiences from one to another. Your own Association indeed has asked that the Bureau employ an experienced field agent who shall devote his whole time to just such a task. It is our earnest hope that we may be able soon to comply with your request.

There is another relation which the Bureau is coming to bear to the land-grant colleges, which I trust may be extended very greatly in the near future. Your Association has a standing committee on college organization and policy, which, I presume, already has reported to this meeting a most comprehensive outline for an investigation of all matters relating to college administration. Mr. Monahan, formerly the Bureau's very efficient specialist

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in land-grant college statistics and now connected with the division of rural education, has acted as the secretary of the committee. If the study can be carried out on lines as broad as those suggested and the results published, it will be an epoch making document or series of documents. I judge that the construction of the outline has been a long task. Certainly the committee or one similar has been long at work. The gathering of data, the arrangement and digestion of them for the completion of such a study, doubtless will take longer still. In this matter we should be able to render you much assistance, even with our present limited force. In fact, already we have agreed to take over two sections of your committee's outline, to gather and correlate the material. The specialist in higher education according to this agreement will make a study of administrative organization and present to your committee a summary of the present administrative practices of American colleges under the heads specified in the outline, or a recommendation concerning administrative organization based on a study of the practices of American colleges, or both, at the pleasure of the committee. The specialist in land-grant college statistics, acting in consultation with Mr. Monahan, secretary of your committee, will do the same with the topic relating to extension work. Possibly we shall be able through our own staff or with the help of outsiders to assist in the investigation of other topics also.

This sort of service with relation to all types of educational endeavor in the country I take to be the most appropriate function of the Bureau, aside from its statutory duties. Inquiries into special methods of teaching are not yet its affair, however much it may be interested in them. But it should be prepared to do the major share of the work in carrying on any important investigation concerning educational administration or general educational policy which is desired by any representative educational organization. It has the machinery for these investigations, including the franking privilege, and it has a staff of workers whose whole attention is fixed on such problems and who are able to give to any such task that they can undertake at all more time than is at the disposal of hard driven college officers absorbed in administration or teaching.

This is a comparatively recent extension of the Bureau's activities. The first steps were taken by Commissioner Brown who secured the addition of several specialists to its staff. Commissioner Claxton has conceived a great constructive program looking in the same direction, namely: to make the Bureau a really effective agency for the scientific investigation of education in all its branches; such an agency as no state and no private organization can support; such an agency as will supplement the work of all state educational officers and all associations. He believes that nothing less will meet the needs of our people; nothing less will be worthy the magnitude of educational enterprise in the United States. He already has made noteworthy progress in carrying out the plan. In the four years of his administration, through increased appropriations and the generosity of private organizations and individuals, about a score of investigators have been added to the Bureau and are engaged in the study of various phases of education many of which were previously outside the range of the Bureau's publications. But the program still is incomplete. The Bureau needs more specialists. It needs to have many of those now associated with it placed on a more permanent footing. Particularly, may I say on my own responsibility, it needs more men in higher education. In spite of the Commissioner's re-

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peated urgent requests, the division of higher education has not been increased since he came into office.

However, the limitation of the Bureau's resources has led it to seek another way to further educational investigation. We are beginning to see that much can be accomplished by assisting and in some cases directing the work of outside investigators: committees of associations appointed to study and report on special topics, professors of education, graduate students, and others. We have gone even so far as to organize a committee ourselves for the study of one very important phase of higher education. It is in this connection that I wish to make to your Association a statement and a request.

You will recall that the Bureau some four years ago began to make a classification of colleges with reference to the value of the Bachelor's degree. A tentative draft dividing into four classes some 350 colleges was drawn up. The basis of classification was the success of the graduates of these colleges in securing the master's degree at strong graduate schools. No attempt was made to visit the colleges themselves. This indeed would have been impossible. The graduate schools were visited, their officers consulted, and the records of candidates for master's degrees carefully reviewed. Then the tentative classification was made and a few copies printed to be circulated among the deans of graduate schools for criticism before final revision and publication by the Bureau. But this document, although not formally published, escaped and went the rounds of the country. It proved to be a very unsatisfactory undertaking to many colleges and their friends. So much so, in fact, that at their instance the President of the United States ordered the Bureau, before the final revision was completed, to suspend the work until further notice. This was more than three years ago and the order still holds.

But, unfortunately, the ratings of the tentative classification also hold in the public mind. Much conscious misuse has been made of them and all unconsciously many agencies have given them a wider application than was intended. Moreover, they were based on records of students all of whom graduated from college at least five years ago, and many of whom graduated as far back as ten years ago. Meanwhile colleges have changed. The standards of many have improved. But the public, in spite of any statements that the Bureau has been able to make, still clings tenaciously to these obsolescent ratings. This has caused many institutions a great deal of embarrassment and has done some few grave injury. The Bureau has a responsibility in the matter which it has no wish to shirk. It has hit upon a plan which it believes will not only bring relief to institutions adversely affected by the former tentative classification, but which will result in a more comprehensive and illuminating study of the higher educational institutions of the country than has yet been made. In this plan, which is in brief as follows, it asks the cooperation of your Association.

The Bureau is organizing a committee composed of representatives of each of the national and wide regional associations of higher institutions to consult with the Commissioner of Education and devise a method of listing colleges and universities with reference to their standards and efficiency which shall be satisfactory to the various types of institutions and the various sections of the country. The Bureau has presented this proposal at the annual meeting of each of the Associations selected for representation. Your Association is the last to be approached. Each of the others, with one exception, has responded favorably and has appointed a delegate to serve on the national committee. This committee already has held one organi-

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sation meeting and has outlined a preliminary plan of procedure. The principal features of the plan are:

First: That institutions shall be listed by groups according to their principal functions; for instance, there will be separate lists of colleges of arts and sciences, schools of technology, colleges of agriculture, etc.

Second: That there shall be no division into classes, as Class 1; Class 2, or Class "a"; Class "b", etc.

Third: That the Bureau shall circulate among all institutions of each group a detailed inquiry, (to be worked out later by the committee) designed to elicit information with respect to equipment, faculty, standards of admission and graduation and certain other matters.

Fourth: That the information gathered in this way shall be tabulated in columns to show the status of each institution under each of the categories selected by the committee as significant in determining collegiate efficiency, and the tabulation published.

Fifth: That the committee shall be called "the committee on higher educational statistics" and shall advise the associations represented that the representation should be continued and the committee maintained as a permanent body to advise and co-operate with the Bureau of Education.

The associations represented on the committee are:

The New England Association of Colleges and Secondary Schools.

The Association of Colleges and Preparatory Schools of the Middle States and Maryland.

The Association of Colleges and Secondary Schools of the Southern States.

The North Central Association of Colleges and Secondary Schools.

The Association of American Universities.

The National Association of State Universities.

The Association of American Colleges.

The American Medical Association.

The Society for the Promotion of Engineering Education.

The United States Bureau of Education.

I have the honor to present to your body the formal request of the Commissioner of Education and of the other members of the committee that the Association of American Agricultural Colleges and Experiment Stations appoint a representative to serve as a member of the committee on higher educational statistics.

I should sit down now, having said all of which I am sure. But I am inclined to agree with the philosopher Maeterlinck that it is sometimes the ideas that are not yet clear that are most valuable. There is one such now in my mind. It is not the product of my own cerebration, so I feel no hesitancy in exhibiting my enthusiasm for it. It was given me some months ago by your President and to him I know that not only is the idea itself clear but also the ways and means of realizing it. On turning over the proceedings of former meetings of your Association I find that he has given it to you, too, at least once. Within the last few hours, also, I have learned that it formed the principal theme of his presidential address, which I was not privileged to hear, and that he there developed a program which had not occurred to me when I prepared what I am about to say. He has pointed out that the land-grant colleges form a group of institutions which are national or semi-national in character. They are to a certain extent under national control. They are beneficiaries of a national fund and they represent a truly national spirit. Here are the elements of a great national system of higher education. The institutions

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themselves have the most important educational mission ever yet performed by a nation's higher schools. Their opportunities for national service are correspondingly great. They already possess a larger degree of solidarity than any other educational group in the country. What do they lack? Perhaps a greater measure of national self-consciousness. Certainly the co-ordinating touch of a federal agency. For obvious reasons I cannot discuss President Bryan's proposal for the creation of a Department of Education to rank with the other departments; but I may suggest that the Bureau of Education as at present organized is not only by the nature of its operations but by law closely related to most of the activities of the land-grant colleges. Of existing agencies it is the logical one to bring about this closer educational co-ordination, this greater nationalization, this completer union among land-grant colleges.

It is in devising means to carry out this coordination with the present resources of the Bureau that my own ingenuity breaks down, unless some of the proposals already made may be said to count. With a larger force, however, even were it but slightly augmented, the way would be clear. Indeed, it all comes back finally to this. The Bureau needs, as the Commissioner emphasizes in the introduction to his last report, additional specialists in higher education. If the work that we have done and the plans that we have outlined, including this last far-reaching proposal, have been satisfactory to you, may I on behalf of the Bureau express the hope that both individually and as an Association you will lend your support to the Commissioner's recommendations for its reasonable expansion.

THE PRESIDENT. The proposition made by Doctor Capen is referred to the Executive Committee for further consideration at this session.

I now have the pleasure of introducing Honorable F. G. Newlands, Senator from Nevada, who will speak upon "Federal Aid to Engineering Experiment Stations."

SENATOR F. G. NEWLANDS of Nevada. The subject assigned to me deals with legislation regarding experimental work in connection with engineering and mechanic arts. This proposed legislation, as I understand it, is supplemental to that which during the last fifty years has been enacted with the intention of developing agriculture and mechanic arts. The progress of this legislation has been exceedingly slow, because the Nation has not as yet found itself as to legislation intended for the general welfare. We have been engaged mostly in the discussion of what constituted the functions of the respective States and of the Nation. The lawyers have been so busy in discussing that question that we have wasted pretty nearly a century in argument. Whenever a question arises as to constructive federal legislation, the great constitutional lawyers in Congress present their threadbare arguments regarding states rights, the distinctions between national functions and state functions and the invasion by one sovereignty on the jurisdiction of the other.

This largely arose out of the situation which developed touching slavery. The Southern states were so determined to protect that peculiar institution that they viewed with the utmost jealousy any exercise of power whatsoever by the National Government, upon the assumption that power, once exercised, gradually would be enlarged and ultimately might involve the downfall of the slavery system. It is an amazing indication of how a trend of mind, national or individual, once adopted is adhered to. In spite of the fact that this question has been settled for over half a century, yet the discussion arising out of it has continued to this day. We find a class of statesmen in the House and Senate whose entire time has been thus expended and who have achieved

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great reputations in blocking useful legislation intended for the general welfare of the country.

I entered Congress some 22 years ago. When I entered the House it was with a well defined theory that Congress ought to enact more constructive legislation, that its attention might well be given to great constructive measures which would insure not only federal activities but the cooperation of the States with the Federal Government, bringing all the sovereignties into team work in legislation that practically would advance the industries and the economics of the entire country.

It has occurred only recently to some of our statesmen that instead of conducting a continuous warfare between the National Government and the several State Governments over questions of jurisdiction, it would be well to secure cooperation of all these sovereignties, and that this could be accomplished in many matters by a scheme of legislation which would involve first, national action and then supplemental state legislation, or vice versa. It is only in late years that the movement, largely commenced during the administration of President Roosevelt, has advanced upon the lines of cooperation between the Nation and the States in legislation designed for the general welfare.

The only pieces of constructive legislation of importance that have been enacted in all our history have been the reclamation acts for the irrigation of our arid lands and the Panama Canal Act; and these great works, conducted by the people of the United States in their collective capacity, have demonstrated our ability to do things, and to do things which hitherto have been regarded as peculiarly within the sphere of private enterprise. In the reclamation of arid lands we have gone far in cooperation, though not so far as we can. The Nation and the States, through their various commissions and bureaus in the arid and semi-arid regions, are acting in cooperation, and future legislation doubtless will perfect that cooperation.

The Government has demonstrated in reclamation work and in the construction of the Panama Canal its capacity to do things honestly, efficiently and quickly. We still have before us, however, the great constructive work of our rivers. It would seem that the idea ought to have suggested itself to the people of the United States a hundred years ago. The jurisdiction of our rivers is divided, the Nation having jurisdiction over navigation as a part of interstate commerce and the States, for the most part, having jurisdiction in other matters. These sovereignties should be united in such a manner that the development of our rivers for every useful purpose might be secured not only for navigation but for the reclamation of arid and swamp lands and the control of water power in the production of electricity. And yet, for over a century the Federal Government has dealt with this great question simply as a matter of commerce, without any consideration of any of the other uses of water and without calling to its aid the functions of the various states in the development of the other uses to which water can be put. The problem was a very simple one, to seize this elusive thing called water, which is our most valuable asset, just as soon as it falls from the heavens, and control it. We cannot as yet control the output of water from the clouds, but we can control the water just as soon as it touches the earth. The combined energies and the combined financial resources of the Nation and the States should have been utilized in this control throughout the entire country, directing it in such a way as to prevent all destructive results and to promote every beneficial use of water. If we had commenced doing this one hundred years ago we would have made great progress in the treatment of our rivers, in the reclamation of arid lands and swamp lands and in the development of water

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power. The promotion of intensive cultivation, the preservation of our forests as the sources of moisture, would have gone hand in hand with the development of navigation. The control of our rivers would have been so perfect that by this time we would have had a net work of natural and artificial waterways throughout the entire country supplementary to our railway systems.

Now it is this spirit of cooperation between the Nation and the States which we wish to promote; a spirit of cooperation that was invoked, perhaps unconsciously, in the original Morrill Act, for while the Nation was called upon to make the grant for public education, the States were made the instrumentalities through which the grant was to be made effective; and that is a vital principle in this proposition.

There should be cooperation between the Nation and the States in all this legislation, for this will obviate on the one side the danger of undue centralization, and on the other side the danger of undue localization. Cooperation between the sovereignties is the thing to be sought, in education as well as in practical and constructive work. The Nation as such has an interest in community training throughout the entire country; in spurring on a lagging community, for the reason that that community is a part of the whole and the general standard of the whole is affected thereby.

Thus far the legislation regarding our land-grant colleges has been in its practical application more beneficial to agriculture than to the mechanic arts, though they were linked together in the original act. It was doubtless the intention of its author and of the Congress which passed it, that each should receive equal recognition. Thus far, if I understand the status correctly, federal legislation has provided annual appropriations to each state for college uses of $50,000 under the second Morrill Act and the Nelson Amendment; $30,000 for the agricultural experiment stations under the Hatch and Adams Acts; and varying sums under the Smith-Lever Act which provide for extension work in agriculture and in home economics, a considerable appropriation in the first instance and much larger sums, gradually increasing and expended in cooperation with the respective states. As I understand it, the experiment station and extension service enactments do not include work in the mechanic arts.

I understand that your Association believes that federal legislation might well be enacted in behalf of mechanic arts similar to that which is enacted regarding agricultural experimentation; that the time is not yet ripe for the establishment of an extension system of mechanic arts teaching, but that experimental work would be well worth while; and that the modest sum of $15,000 annually is sought for each state. I see no reason why such legislation should not be enacted promptly. I see no reason why a sum equal to that granted for the use of agricultural experiment stations should not be appropriated in the interests of mechanic arts, for the advancement of the mechanic arts of the country is no less important than that of agriculture.

However, the war situation has caused difficulties, as have also the changes that have occurred in our economic legislation. When I entered Congress I applied myself, so far as I could, to constructive legislation. However, just before the Cuban war I was placed upon the House Committee on Foreign Relations, an agreeable assignment because of its activity. When I entered the Senate I declined an invitation to go upon the Foreign Relations Committee, believing that we were through with war. I turned towards the constructive committees, such as those on Commerce and on Interstate Commerce. But recently we have been nearly involved in a war with Mexico and now find

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ourselves involved in the world-wide complications caused by the European war. These things have drawn the attention of Congress away from almost all domestic legislation; and that is the discouraging feature with reference to this proposed legislation.

At the commencement of this administration the Democrats entered upon economic and reform legislation touching the tariff, the banks and the trusts. As a Democrat I shared in that legislation, and was in general sympathy with it, although I was in a hurry to get through with it in order that we might get at constructive legislation. I regret to say that in that economic legislation the Democratic party acted with more force and power than persuasiveness. I wished that a more gradual scheme of legislation had been enacted, one that would have made gradual economic changes in our legislation, the effect of which would not be felt seriously in the present or in the near future, and which would depend for substantial results upon the lapse of a generation at least; but in all reform measures it is impossible to restrain the ardent. We moved a little faster than I thought prudence justified. I held out for a long time in the course of that legislation and finally yielded to the demands of my party rather than make the party will ineffective. The result has been to create more or less disturbance in business, in banking and in trade, resulting in a temporary constriction of the nation's energies. Of course I do not doubt for a moment that these reforms were needed and that the general character of the legislation was beneficial. However, there can be no question but that its immediate effect was in a measure to retard the activities of the entire country. Then, when we were just recovering from those conditions, on came the European war with all its complications of trade and business and the resulting complications regarding the revenue. All our calculations with reference to revenue under the acts which we passed were upset; and so we have been obliged to resort to further revenue legislation. The result today is that there is a deficiency, that the surplus in the treasury soon will be exhausted, and that the immediate work in hand before Congress seems to be the formulation of a budget which will cover completely all the requirements of the country.

Now I trust that Congress at the next session will take a large view of the situation, that it will not confine itself to the narrow economies, and that it will provide sufficient revenue to carry not only the general work of the government itself, but also these great constructive works that are before us—the reformation of our entire scheme of public buildings; the reformation of our entire scheme regarding the development of our rivers; and constructive work on the lines of educational aid and educational cooperation between the Nation and the States.

I am inclined to think that before we can get at legislation of this kind, we will have to provide for this other legislation. It is incumbent, therefore, on every thinking man to add his mite to the popular judgment regarding the measures that are to be adopted in order to increase the revenue of the country; and there I feel we may have difficulty. For instance, we are likely to lose $50,000,000 annually when sugar is finally freed. It seems to be clear that the operation of that act, providing that sugar should go on the free list at the end of three years, should be delayed for at least five or ten years longer; and yet that subject will be the cause of discussion and debate, possibly sufficiently fruitful to occupy the attention of Congress during the greater part of a session, unless we can establish a cloture that will limit long-winded debates.

Then questions will arise as to an inheritance tax. The States gradually have been levying taxes upon inheritances, and there is no reason why the

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Nation should not impose a similar tax; but I imagine that that would promote long discussions. If we are to have inheritance taxes, the system should prevail throughout the United States and not simply in the individual states which become the victims of their own virtue by the levy of a tax which stimulates wealthy men to cross their borders to other states. There will be practical questions of internal administration outside of the great international questions that now are absorbing the attention of the President to the exclusion of almost everything else. So I would not lead you to hope for immediate results; yet I would not discourage your efforts for a moment. They should commence immediately and take the form of bringing the pressure of home public opinion to bear upon the several congressmen and senators. It seems to me that there can be no better place for the generation of sound public opinion than in our state universities and in our land-grant colleges. Each one can influence the judgment and the action of its student body and graduate bodies, and bring this public opinion to bear upon the individual representatives and senators. It took us ten years to pass the reclamation act; and that finally was accomplished only through direct pressure brought to bear upon the individual representatives and senators through an organization that kept the question continually before them

I am inclined to think that perhaps you have passed by a favorable opportunity of presenting this matter. When Congress was considering the Smith-Lever bill—the Southern States being greatly interested in agriculture and caring but little about the mechanic arts—they were intent upon passing that bill. It would have been a favorable time for those states that were interested in the development of the mechanic arts to have insisted upon it that the two should be yoked together; but that opportunity has been lost. However, if there should be earnest individual action on the part of each one of these educational institutions, resulting not only in the careful education of all of the representatives and senators but resulting also in the pressure of public opinion upon each one of them, results should come quickly. The very modest sum asked, aggregating about $750,000 annually, ought not to make this a very hard task as compared with pushing the great constructive bills now before Congress. We are now considering the River Regulation Bill which I had the honor to introduce in Congress several years ago, which calls for an expenditure of $60,000,000 annually for a period of ten years. At first this quite took away the breath of Congress, but it is now being considered seriously. It passed the Senate upon one occasion, but as yet the members of the House have not been educated up to it; so that you see Congress is getting accustomed to big figures.

I join with all of you in my appreciation of the importance of the development of the mechanic arts. The promotion of efficiency is most important in all our industries. We are beginning to learn in this great European contest what efficiency means, not only in war but in production and in trade. Too much attention cannot be given to it. We are doing our best for the promotion of agriculture and ought to do our best for the promotion of the mechanic arts. And we ought, before long, to do more to promote the welfare of our fine arts, for on these things and their development and promotion the material part of civilization is based. The fine arts involve the beautiful, and agriculture and the mechanic arts involve the utilitarian. The highest wisdon demands the union of beauty and utility in all our work. I trust that before long democracy will have demonstrated to the world its ability not only to secure the highest utilitarian development of its people, but also their highest artistic development.

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THE PRESIDENT. This Association is under great obligations to Senator Newlands for his able presentation of this subject and of its relation to the greater and broader questions that now are engrossing the attention of the Nation. We are profoundly grateful to him for his presence here, for his sympathy in this great work and for his ability to present its merits in Congress. The extreme importance of the higher technology is demonstrating its worth as it stands behind the manual skill and dexterity of the workman. The importance of any well conceived movement to foster this technology as a national measure should impress itself very deeply upon our people, and particularly upon the members of this Association.

The acting chairman of the Executive Committee will now present its final report through its acting chairman, H. J. Waters of Kansas.

REPORT OF EXECUTIVE COMMITTEE

The Executive Committee respectfully submits the following matters for consideration and action:

1. Touching the resolutions offered by the committee on graduate study (page 72) reading as follows:

Resolved, That it is the sense of this Association that the best interests of the individual institutions would be advanced and the efficiency of the work of the Association as a whole furthered greatly by the adoption of a definite policy whereby at least a certain fraction of the workers in each institution should be enabled to attend each session of the Graduate Summer School of Agriculture.

Resolved, That the Association recommends to the several institutions that time spent in attendance at the Graduate Summer School of Agriculture be not deducted from the vacation leave of members of the staff but be treated as an absence with pay on the business of the institution.

In view of the fact that this Association has stood sponsor for the Graduate School of Agriculture from its inception fifteen years ago and contributes largely to its financial support, the Executive Committee feels that the resolutions should be supported and so recommends.

2. The Executive Committee recommends that the customary appropriation of two thousand dollars be made towards the expense of conducting the 1916 session of the Graduate Summer School in Agriculture in cooperation with the Massachusetts Agricultural College.

3. Touching the resolution offered by Mr. Storm of Minnesota (page 130) reading as follows:

"*Resolved*, that the Executive Committee be authorized to print separates of the reports of the standing committees, in advance of the annual meeting, when in its judgment the value of the early printing of such reports would justify the additional expenditure."

The Executive Committee respectfully submits that such a procedure, though highly desirable, does not seem to be feasible. The memberships of the standing committees are widely scattered and committee reports, as a rule, are not completed until the day before, or, indeed, on the initial day of the convention. Therefore, the Executive Committee recommends the adoption of the following substitute resolution:

Resolved, that it is the sense of this Association that the reports of standing committees should be printed promptly and distributed as separates in advance of the issuance of the completed proceedings, whenever in the judgment of the Executive Committee the interests of the Association would be advanced materially by such action.

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4. At the last convention, two matters were lodged by vote with the Executive Committee, namely:

(a) The consideration of recommendations looking toward increasing the efficiency of military instruction with a view to suggesting definite legislation thereon at this convention (28th Proceedings, page 156).

(b) The futherance and perfection of proposed federal legislation in behalf of vocational education (28th Proceedings, page 162).

The Committee has not been able thus far effectively to prosecute these matters and desires to be advised by this Convention whether or not it should pursue them further. The long session of Congress will be held before the next convention. The Executive Committee recommends that the action of the last convention touching these two matters be reaffirmed.

5. The Executive Committee recommends that the annual dues for the ensuing year be fixed at the same amounts which have prevailed for several years, namely, thirty-five dollars for the colleges and twenty dollars for stations.

6. The Committee has received the following communication:

DEAR PRESIDENT WATERS:

The Executive Committee of the new Engineering Division of the College Section begs to suggest that the Executive Committee of the Association of Agricultural Colleges and Experiment Stations consider a recommending resolution authorizing it to take any practicable steps during the coming year to secure federal legislation in favor of the establishment of engineering experiment stations. The Land-Grant College Engineering Association, after extended discussion of this subject, has instructed its Executive Committee to act in this sense. We venture to hope that the American Association of Agricultural Colleges and Experiment Stations may deem it appropriate to take this action after Senator Newland's address on Friday morning.

Respectfully yours,

H. W. TYLER,

President.

The Executive Committee in response to this request recommend the passage of the following resolution:

Resolved, that this Association reaffirms its belief in the advisability of the establishment of engineering experiment stations and of federal legislation to that end, and instructs its Executive Committee to urge congressional action whenever in its judgment such a step seems advisable.

7. The Committee, for the sake of emphasis, reiterates the suggestion made in its initial report and urges all college administrators to communicate with the Executive Committee in case difficulties or misunderstandings arise in connection with their relations with the Federal Department of Agriculture, to the end that the information thus vouchsafed may serve as a basis of discussion with the departmental officials and an aid in adjustment.

Respectfully submitted,

H. J. WATERS,

Acting Chairman.

On motion, the report of the Executive Committee was received and the recommendations made in items one to six inclusive were adopted.

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H. J. WATERS. Touching the suggestion made by the Commissioner of Education, as presented by Doctor Capen in his address. The Executive Committee has had only a few moments in which to consider the matter. However, it suggests that the Association would be willing to appoint a delegate to cooperate with the Bureau of Education in considering the formation of a committee on higher education. It recommends that the Association do not accept the proposition as presented by Dr. Capen.

This Association had a right to expect to be invited to participate in a movement of this kind, as soon as, if not in advance of, any other Association. Speaking for myself, I feel that it had a right to expect to be invited to participate in the movement before an organization was perfected and before a meeting of the joint committee was held and a plan of procedure outlined. There are other reasons actuating the Executive Committee in its recommendation, fundamental reasons which need not be discussed at this moment.

S. B. CAPEN. I am to blame personally for the delay in presenting this matter to this Association. It has been a matter of consideration with us for something like a year and a half as to what associations should be brought into the movement. Our desire first of all was to get a body small enough to work. After I had reviewed the situation several times, personally it seemed to me that the interests of the institutions of this Association would be represented in a large measure through the National Association of State Universities. I did not appreciate my mistake until recently. After the close of your last annual meeting, it was pointed out to me by one of your members, President Ayres of Tennessee. I then very much regretted that I had not taken the necessary steps to bring this proposition before you at your last meeting and decided to suggest to the Commissioner that it be brought before this present convention. He was much annoyed that the matter had been brought to his attention so late. When I prepared my paper I had planned to make this statement therein; but time as a commodity is worth something and it seemed to me that it was not necessary. I am glad of the chance to make it now and to assume personally all responsibility for omission or any slight. I assure you that, so far as I am concerned, no slight was intended.

When the committee met, as it did about a month ago, because we felt that the matter was important enough to proceed with, everyone felt that your Association should be represented. I hope that your Association will join whole heartedly in the movement, for we greatly need your help.

THE PRESIDENT. I think I may venture to say on behalf of the Association that its feeling would be perhaps that the legal relations between the Bureau of Education and the land-grant colleges are so close, and the colleges are so many in number and so widely scattered throughout the country, that a committee constituted as has been suggested would hardly be adequate to accomplish the end in view, even though the Association did participate in the movement.

On motion, the recommendation of the Executive Committee to the effect that the Association express its willingness to appoint a delegate to cooperate with the Federal Bureau of Education in considering the formation of a committee on higher education was adopted, and the Executive Committee was authorized to select such representative or delegate if, in its judgment, the interests of the Association justified such action.

J. L. SNYDER of Michigan. Within a few blocks of this place lives a man who in former days has been very prominent in the councils of this Association; who before it was formed was a prominent member of a land-grant college faculty; a man of the early days, one of the few pioneers now living to whom we

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owe much of the development of the institutions we represent. I refer to Doctor E. W. Hilgard, formerly Director of the School of Agriculture of the University of California. An accident confines him to his house, and he cannot be with us today in body as he is in heart. I move that the officers of the Association call upon him personally, express to him our appreciation of the great work that he has accomplished and convey to him our best wishes and greetings.

The motion was seconded and carried.

THE PRESIDENT. Nominations for president of the Association are now in order.

F. B. MUMFORD of Missouri. I place in nomination for president of this Association the name of Director Charles E. Thorne, of the Ohio Experiment Station. It is entirely unnecessary for me to make a nominating speech in his behalf. This Association has been particularly fortunate in its presiding officers. In electing Director Thorne as president, the high standard set in the past will be fully maintained.

The nomination being seconded, on motion, the secretary was instructed to cast one ballot for C. E. Thorne of Ohio as president for the ensuing year; and he so cast the ballot.

Other officers were elected in similar fashion as follows: Vice-presidents, W. M. Riggs of South Carolina, R. J. Aley of Maine, J. M. Hamilton of Montana, E. A. Burnett of Nebraska, R. W. Thatcher of Minnesota; secretary - treasurer, J. L. Hills of Vermont; bibliographer, A. C. True of Washington, D. C.

Reports were made by the nominating committees of the sections as follows:

College section—For chairman, A. R. Hill of Missouri; for secretary, C. A. Lory of Colorado; for program committee, the chairman and secretary; for members of Executive Committee, W. O. Thompson of Ohio, H. J. Waters of Kansas, B. Ayres of Tennessee.

Station section—For chairman, B. W. Kilgore of North Carolina; for secretary, R. S. Shaw of Michigan; for recording secretary, W. H. Beal of Washington, D. C.; for program committee, the chairman, secretary and recording secretary; for members of Executive Committee, W. H. Jordan of New York, H. L. Russell of Wisconsin.

Extension section—For chairman, K. L. Hatch of Wisconsin; for secretary, J. H. Miller of Arkansas; for recording secretary, D. A. Brodie of Washington, D. C.; for program committee, the chairman, secretary and recording secretary.

On motion, the nominations by the several sections of chairmen and secretaries were approved.

THE PRESIDENT. The following persons are appointed to serve on standing committees for the next three years:

On instruction in agriculture, J. F. Duggar of Alabama, A. V. Storm of Minnesota.

On graduate study, W. O. Thompson of Ohio, B. Ayres of Tennessee.

On college organization and policy, K. L. Butterfield of Massachusetts, C. A. Duniway of Wyoming

On experiment station organization and policy, B. W. Kilgore of North Carolina, E. W. Allen of Washington, D. C.

On extension organization and policy, Alva Agee of New Jersey, C. W. Pugsley of Nebraska.

The following persons are appointed to serve on the committees bearing relation to the United States Department of Agriculture.

The committee on relations: The Executive Committee.

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The committee on projects and correlation of research: For three years, W. R. Dodson of Louisiana; for two years, J. G. Lipman of New Jersey.

The committee on publication of research: For three years, E. M. Freeman of Minnesota.

On motion, the thanks of the Association were extended to the administrative officers of the University of California for the courtesies extended during the convention.

On motion, adjourned *sine die*.

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MINUTES OF THE SECTIONS

SECTION ON COLLEGE WORK AND ADMINISTRATION

THURSDAY AFTERNOON, AUGUST 12, 1915

The section was called to order at 2 P. M. by the chairman, H. J. Waters of Kansas.

THE CHAIRMAN. The chair appoints as nominating committee, E. E. Sparks of Pennsylvania, E. A. Bryan of Washington and C. F. Curtiss of Iowa.

E. A. BRYAN of Washington. At the last convention, during the morning session of Friday, November 13, Dean Curtiss moved "that the section on college work and administration be requested to create a division of engineering" (twenty-eighth proceedings, page 150). The motion was carried. The Constitution (twenty-eighth proceedings, page 16) states that "each section may create such divisions as it may from time to time find desirable", and that they "shall elect (their) own chairmen," etc. There is the constitutional authority to create a sectional division and the request of the general session that such a division be created. I, therefore, move that a division of this section be created to be known as "the division of engineering", and that a committee be appointed to notify the Land-Grant College Engineering Association of this action.

The motion was seconded and carried.

THE CHAIRMAN. I will ask Presidents Bryan of Washington and Sparks of Pennsylvania to notify the members of the Land-Grant College Engineering Association of this action.

It is a moot question whether the men who are teaching agriculture in our colleges are as well trained and prepared for their work as are those teaching other subjects. No more important matter can be discussed than "The Preparation Required for College Teachers in Agriculture". I present President R. A. Pearson of Iowa who will discuss this subject.

THE PREPARATION REQUIRED FOR THE COLLEGE TEACHER IN AGRICULTURE

BY R. A. PEARSON

There has come a sudden increase in the demand for teachers of agricultural subjects in institutions of higher and secondary grade. This is felt keenly in our colleges where the student enrollment has been doubling in short periods of time. The subject of this paper brings up one of the most difficult problems connected with land-grant institutions. Its consideration is not limited to the one who is looking forward to a teacher's career but includes those who are now engaged in teaching and propose to continue as teachers.

Colleges of agriculture are training men to become farmers, teachers, and investigators. Many of these should become recognized leaders. Through them, directly and indirectly, the majority of persons concerned in agriculture will be reached and benefited.

It goes without saying that good character is an essential qualification. It is so with all important positions, but here it must have the strongest emphasis. Plain old-fashioned honesty is a vital quality and though it is so often found it is worthy of special mention. Other traits of character, including thoroughness, tact, patience, loyalty and good cheer, which come largely from belief in one's work, are most desirable in a teacher.

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The special training may be discussed under four heads: academic, technical, practical and pedagogical.

1. ACADEMIC

The academic training required cannot be different from that offered in the public schools and colleges. It should be as broad and thorough as possible, not neglecting the fundamental sciences and especially the three R's. It is an advantage to have one or two modern languages included, and a course in business or book-keeping. It is often waste of time, however, for students to take certain academic subjects which must be repeated in college, for example, chemistry, which must be taken in some institutions in the beginners' class, whether chemistry has been taken in the public school or not. Where such rules prevail, it would be better to spend the high school chemistry time on some other subject, as language, book-keeping, or some science other than chemistry. Enough of the fundamental sciences should be included to enable the prospective teacher to understand their more common applications and to build upon them in the future. The agricultural chemist should be trained especially in physics, geology, mineralogy, botany and bacteriology; the professor of animal husbandry needs training in chemistry, physiology, sanitation, etc.; the agronomist must deal with the soil and with plants and his training should include physics, geology, bacteriology, chemistry and general and physiological botany.

The teacher of agriculture should be proficient in the use of the English language. Far too many men in the agricultural colleges are seriously handicapped because they lack simplicity, directness and force in both their spoken and written language. The man who achieves success in the class room or in addressing public gatherings must be trained, both in writing English, and in clear, forceful public speaking.

Again, teachers of agriculture, just as truly as other teachers, should have a broad and wholesome outlook upon life. For this reason, their training in the humanities should be thorough. The agricultural specialist cannot afford to be narrow; he must have wisdom and a view point, in order to deal successfully with agricultural questions that affect the interests of the country or the state.

2. TECHNICAL

It is a great advantage to a teacher of agriculture to have had a general technical training in agriculture. But the time is coming when intending teachers must have an advanced degree before being appointed to a professorship of any grade in a strong agricultural institution, although there always will be notable exceptions to this rule. This is true because the information available along different important lines is so extensive it cannot be acquired in the period of a four-year course. It is vital that a professor have a thorough training in his own and closely allied subjects. He should feel himself a master of some phase of agriculture, at least in so far as any one can be a master. The training should include seminar and research work, sufficient to form the habit of inquiry into new and difficult phases of a subject. The teacher should be acquainted, at least through their writings, with the leading authorities of the world upon his subject; and it is a great advantage to know them personally, or at least by correspondence. It is fortunate that this is possible to a great many teachers in this country.

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Technical preparation involves continuous study. Agricultural subjects, in these days, are having new knowledge added to their store almost constantly, and the successful teacher will spend considerable time in keeping himself posted concerning this progress. He will be cautious about accepting new ideas and theories of doubtful value, and he will be quick to recognise those having real value.

With some college teachers it has become a more or less established custom to attend scientific gatherings where their particular subjects are discussed. Sometimes this is at the college expense. Whether this liberal arrangement prevails or not, the advanced technical teacher will not fail to meet with others following the same line in other institutions, as often as possible. At least once a year he should come in contact with a number of those occupying corresponding positions elsewhere, and at least once a year he should visit another institution to get their latest and best ideas concerning equipment, methods of instruction, etc. If these trips are not provided for by college funds, they should be taken at private expense, because the teacher himself cannot afford to be without the information that such trips yield.

An important way of keeping abreast of scientific progress is to interest oneself in some problem requiring scientific investigation. Every agricultural teacher should have some such problem in mind and study it as conditions permit. Those who are carrying a teacher's load should not allow themselves to be burdened by too many of these problems. It is a serious mistake to have none and it is just as bad to have too many. One or two problems for investigation as time permits do much to keep a teacher up with the times and to keep him in touch with those who are helping in the developments along his particular line.

3. PRACTICAL

In agriculture particularly it is important for the technical expert to be familiar with the practical end of his subject. Otherwise he cannot truly sympathize with those for whom he works. The man who teaches dairying and does not himself know how to milk a cow; or the one who teaches agronomy, yet has not himself held the plow, seldom is able to grip a class of practical-minded students. It is not necessary to have spent one's life on the farm to secure this practical training, but considerable time should be spent there, and enough so that the teacher will feel at home among his farmer students or among those older ones who are working along his line.

It is a great help to him to be in frequent touch with some practical farm, but not in a way to divert him from his teaching work. Also it is of great value frequently to mingle with farmers, on their farms and in their gatherings; too often this is sadly neglected. The knowledge of farm practice should include conditions in more than one locality. The teacher should know how farmers in widely different localities and surrounded by different environments are handling their problems and adapting scientific knowledge to their needs. It is well, therefore, for the teacher or the prospective teacher to keep in touch with agricultural newspapers and agricultural organizations and to visit farms on his travels.

Particularly the teacher should be able to apply his knowledge of his subject to the practical side. This requires more ingenuity and tact than is generally supposed. Some of his students will become teachers or investigators, some will enter agricultural journalism, others will become managers of rural organizations, but most of them will go directly into the practice of

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agriculture. The successful teacher should know enough of these activities to relate his instruction to their daily routine.

4. PEDAGOGICAL

Too many agricultural teachers are lacking in pedagogical training or experience. This condition has come from the fact that agricultural teachers have been in such great demand that almost any one trained along technical lines and desiring to teach could find a position with no questions asked concerning pedagogical ability. But an end must come to this. The law of supply and demand already is helping to sift the poor teachers from the good ones, and it is giving preference among new candidates to those who have had training in education. It is not right to students nor taxpayers, for teachers to acquire teaching ability through their own experience alone. They should know how to present their subject, how much to present, what parts may be emphasized best, omitted or slighted, and their teaching should be done easily and with such confidence and enthusiasm as to inspire students with a liking for the subject.

An excellent plan has been started at one state university, and perhaps at other institutions, whereby members of the faculty who have not had training in pedagogy are permitted or required to take a limited amount of this work. This policy should be extended. If the matter is presented rightly to a teaching staff, it is likely that they would welcome the adoption of the plan for the benefit of themselves and their students. It would be well to carry the idea further and arrange for teachers to exchange visits among themselves, as has been done sometimes for the purpose of criticism and suggestion. One teacher of the writer's acquaintance for a long time used so low a tone that his voice could not be heard across the room. The students did not like to criticise and they were deprived of much of the benefit which they were entitled to receive. A suggestion from a friendly colleague was all that was needed. Teachers can well afford to give some time to help one another in this way.

In a word, the best teacher in agriculture in a college is one who by natural endowments and hard earned acquirements will attract students, instruct them and inspire them. He will make their problems his and he will look forward and in his imagination will see his students using what he teaches them and thus becoming of greater value to themselves and their fellowmen. This means he will have a clear vision of commercial and social agriculture in the progress of their best development.

THE CHAIRMAN. If no objection is raised we will open the whole subject of preparation for discussion after the three addresses have been made. I now present Dean T. F. Hunt of California who will discuss "The Preparation Required for Research Work in Agriculture".

THE PREPARATION REQUIRED FOR RESEARCH WORK IN AGRICULTURE

BY T. F. HUNT

One-fourth of an undergraduate's curriculum should be chosen from the following sciences: bacteriology, botany, chemistry, entomology, economics, geology, plant pathology, physics, physiology, and zoology; and another one-fourth should be chosen from the following technical subjects: agricultural chemistry, agronomy, animal husbandry, citriculture, dairy industry, farm machinery, farm management, fertilizers, floriculture, forestry, irriga-

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tion, landscape gardening, pomology, poultry husbandry, soils, veterinary science and viticulture. In addition to this training, he should have a reading knowledge of at least one foreign language and at least a spelling knowledge of his own language.

This is the only concrete thing I intend to say about this subject. Indeed, I believe I have said about all there is to be said. A man some of you know was called upon to give an address before a State Horticultural Society on the subject of pruning. He arose before the large and expectant audience and said, "If I found a branch that was in the way I would cut it off." Then he took his seat and not one other word would he say upon the subject. He had said about all that anybody knows about pruning trees, and I have said about all I know about training a man for research in agriculture; but, of course, you expect me to say something about the training a man should have after he has his bachelor's degree. The best thing for a man to do after he has his bachelor's degree is to get a job and try to make good. If he makes good, there is nothing more to be said. If he fails to make good simply because he does not happen to have the requisite knowledge and training, then he should pick out the best professor of the subject in which he is interested that he can find in the world and study with him until he gets the requisite knowledge and training. However, if he has failed because of lack of interest, lack of persistence, or lack of mental aptitude for research, he should have a heart-to-heart talk with himself and determine what his future line of endeavor should be.

It is all very easy to talk in an academic manner concerning the need of better trained men. It would not be difficult to outline a theoretically desirable course for every young man to follow who is going into research. However, when you come to the very practical matter of employing research men, you are very much in the position of the man who is trying to buy cows. If he tries to buy good milch cows simply, he has a rather wide choice. If, however, he tried to buy good red milch cows, he limits his range of choice. If he goes still further and tries to buy good red milch cows with white tails, he not only still further limits his opportunities but he has eliminated some of the very best milch cows. If one limits his choice of men to those with Ph. D. degrees, he is in the position of the man who insists on buying red milch cows with white tails. Whenever it becomes my duty to select a man for research work I ask myself three questions: (1) Does he know his subject? (2) Is he a profound investigator? (3) Does he get on well with other people? How he comes to know his subject or whether he inherits aptitude for research from his maternal or paternal grandfather does not concern me. The last thing I ever think about is the degree he cherishes. If, perchance, it should come to my attention that he has a Ph. D. degree and has not shown marked success hitherto—well, if a man has acquired a Ph. D. degree, it is up to him to live it down. Of course, everyone is in favor of more and better training. It is the only method by which any progress is possible. It is so easy to say it that one hardly can refer to it without swearing. When, however, we come to look the situation squarely in the face, we will find, as a matter of fact, that too large a proportion of the graduate students consist of two classes: (1) left-overs; (2) persons who have not been wholly successful. If the cause of the lack of success has been due merely to a lack of knowledge and training which further study will correct, all goes well. If the lack of success is due to some inherent inaptitude, further training can accomplish little.

It is said,—I cannot personally vouch for the statement—that many, perhaps most, A. M. degrees are taken by teachers who have not succeeded.

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The applicant enters upon graduate work with the hope that the situation will be covered up and a better position obtained a year later. Of course, it is a perfectably admirable and sensible thing for the person to do, but it is essential to this discussion to understand the motive distinctly. The fact is that a student who has spent four years in a high school and four years in a university and has red blood in his veins, desires to get to work. He is looking forward to becoming self-sustaining and to starting a family. The upper twenty percent of the graduating class, judged with respect to scholarship, personality and "pep", have no difficulty in finding work to do after securing the B. S. degree and most of them succeed. The man who is willing to continue his training until he is twenty-eight or thirty years of age and puts off becoming self-supporting, so that he may marry, until he is thirty-five, is an abnormal man. The normal man will not stand for it. The colleges of agriculture desire normal men.

There is, however, one type of graduate work which should not be overlooked. There has been one institution, and perhaps more, that has been particularly noted for its number of graduate students and for the wide influence these students have had upon the agricultural institutions of this country. When, however, you come to consider its graduate students, it will be found that most of them did their undergraduate work in some other institution. There is no evidence of marked success of the graduate work when applied to students who took their undergraduate work in the same institution. Without any doubt, it is a great asset for any student to come in touch with the ideas of two distinct faculties and the practices and traditions of two institutions of learning.

To return then, to my original statement, the best thing for a man to do after his bachelor's degree is to get a position—spelt with three letters—and try to succeed. It does not matter whether he does the work for nothing, or whether he does it for a degree, or whether he does it for a thousand dollars a year. The main question is, did he accomplish results? The only proviso which I would make is that the work should be done elsewhere than in the institution from which he graduated.

THE CHAIRMAN. I present Dr. A. C. True of Washington, D. C., who will now address you touching "The Preparation Required for Extension Work in Agriculture".

A. C. TRUE. I have not been able to undertake the preparation of a formal paper for this occasion, but am glad to discuss the subject with special reference to the work done by the committee on instruction in agriculture this year along this same line.

My point of view with reference to this matter and to the subject that was treated by the last speaker perhaps is somewhat different from that which he voiced. If it is true that the colleges of this country, and particularly those represented in this Association, are in such a condition that their graduate courses are simply or chiefly attractive to a weak and inefficient class of students, it would seem that something was radically wrong with the situation, with the educational world in general. The educational world more and more has taken the position that those who were to occupy its higher positions and direct its activities should have a thorough training under the supervision of competent instructors, and that this training should not be confined to or limited by undergraduate courses. If the graduate work is in bad condition at present, certainly something ought to be done to remedy the situation.

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I am to speak with special reference to the preparation of extension workers; and in doing that I shall state first a few general considerations and then take up some matters that were brought out in connection with the inquiry made by the committee on instruction in agriculture.

The extension worker, in the first place, is a teacher. I put that first and emphasize it because we are apt to forget it or to minimize its importance; partly because of the history of the development of extension work in this country and partly because of the duties, which, in many cases, have been imposed on extension workers. Until a comparatively recent time, the extension workers in the United States have been propagandists, or they have undertaken to give information on a few specific things; but now we are confronted with an entirely different situation, because through federal and state legislation a permanent system of extension work has been created which is comprehensive in its outlook in regard to agriculture and home economics. Certainly the extension worker will not have the right point of view or do his work in the best way, unless he considers that his duty not only is to tell people certain things, or to show them certain things, but also is to educate them, and to teach them something. And so I think of the extension worker in the first place as a teacher.

An extension worker should possess a knowledge of his subject, a clear understanding of the mental processes of the persons to be taught and information regarding the methods which good teachers use in imparting knowledge to others. He is a vocational teacher. He is not called simply to teach the theory of agriculture, but more particularly its practice. He should be thoroughly acquainted, therefore, with the practice as well as the theory of his art. He should know how to conduct demonstrations along practical lines, and to bring his students not only to know how or why agricultural demonstrations are conducted, but to take an intelligent interest in putting into actual practice what he teaches. In that respect he does not differ from any other vocational teacher. When a man teaches the art of carpentry it is expected that in the end his students will be able to make useful and desirable things out of wood. So the extension worker in agriculture properly will be judged by what he actually succeeds in getting into practice in the art of agriculture.

He is also a counsellor with the farmers on agricultural practices and rural affairs. He should know, therefore, their actual conditions, what is practically feasible, and what are the present limitations of knowledge on the subjects with which he deals.

He is a purveyor of information through oral, written and visual communication. He should know, therefore, how to express himself clearly, simply and convincingly in the language of rural people, both as a writer and a speaker, and should present the things which really show what they purport to teach. Oftentimes he will be called upon to impart ideas which are new to the people he is addressing or against which they are strongly prejudiced. He should be able, therefore, to employ intelligently and effectively the proper art of the advocate. He will often be called upon to act as a go-between, to put the farmer into touch with scientific and practical specialists. He should know, therefore, the sources of special information in agricultural lines and be able to judge when the specialist is required or will be useful.

Broadly speaking, we may classify extension workers as specialists and general practitioners. In many cases the specialists will engage in extension work only incidentally, but as time goes on there will be an increasing number of specialists giving most or all of their time to extension work. These persons

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should have essentially the same preparation as general practitioners and in addition some special training.

Considering the nature of the business of the extension worker, ordinarily it will be a great advantage to him to be farm-raised. In some cases he may be able to overcome the handicap which the lack of this experience entails, but in some way he must gain the practical experience and point of view of a farmer.

Since a large feature of extension work, as the term implies, consists of the extending or carrying out to the farmer of the special knowledge acquired by the agricultural colleges, experiment stations and departments of agriculture, the extension worker should know how to acquire and to use the knowledge possessed by these institutions. Ordinarily this will mean that he should have an agricultural college education. As it is commonly believed that a young person does not do well to specialize with reference to his ultimate calling until he has reached his junior year in college, we may presume reasonably that up to that point the prospective extension worker, in preparatory school and in college, will pursue those courses and studies which will give him a general acquaintance with agriculture, the natural sciences, the English language and literature, mathematics, history, etc. Beginning with the junior year, and if possible extending over a period of three or four years, there should be an increasing amount of specialization with reference to the particular requirements of extension work. This may include the study of particular forms of agriculture, rural economics and sociology, farm management, educational psychology and methods, the art of writing and speaking, extension methods and practice, organization work and literature of agricultural institutions and the like.

A certain period of actual farm practice after graduation, up to a certain age limit, is a good thing. I think that we will realize that we are under obligations not to make our educational program so extended that the men cannot get into actual work in their professions until they are advanced in years. The ideal thing, probably, is that the worker should be ready to begin actual practice in his chosen profession in a serious way by the time he reaches the age of 25 years. We hear much about the need of extension workers who have gray hair and long practical experience. Of course, if that experience has been of the right kind, and there is a middle aged man who is well trained and expert and has the other qualifications, the appointing officer may do well to take him on as an extension worker; but in the long run this will be the exception. In the profession of extension work, just as in any other work, we shall expect generally to use the young men, believing that they will gain in experience and strength as they advance in years. As a rule this limited preparation to the approximate age of 25 years, applies to this kind of work as well as to medicine or law or any other profession.

When the extension worker has had preparation in the schools and colleges and also has had apprentice work and has been credited with the success he has attained as a member of his profession, he should have of course the same opportunities for further training and improvement that are given to teachers wherever a liberal and intelligent policy obtains. In other words, he should have regular opportunities for observation and study through travel and attendance on special courses of instruction, in order to broaden his knowledge and to bring his information up to date.

There is nothing new in what I have said thus far. I have summarized simply what has been said by other people in other ways, and perhaps in

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this year's report of the committee on instruction in agriculture with reference particularly to extension work.

It may be interesting at this point to call attention very briefly to certain matters which were brought out in the inquiry which our committee made, because this will serve to illustrate the views of the college officers and others who are now dealing with this subject in the institutions represented in this Association. The question was asked whether farm experience should be regarded as a prerequisite to entrance on a course of undergraduate instruction where a man had chosen extension work. Nearly all who answered this question believed that a rather rigid farm experience should be insisted upon as a prerequisite. In regard to the makeup of the undergraduate courses, about eighty percent of the answers favored prescribing at least half of the course, and nearly all favored prescribing a minimum fundamental course in agriculture and its related sciences. About three to one of the answers were in favor of some specialization in agriculture during the undergraduate period. Most of them expressed the belief that a distinct difference should appear between the required work of extension specialists and the work of county agents or of other general practitioners along this line. There was also general agreement that the electives should be confined largely to the junior and senior years. Training in the economic and social sciences also was generally approved, and perhaps more emphasis was laid upon this because of some of the questions which were brought out in President Hill's paper this morning. It appears that under present conditions the agricultural colleges are not laying sufficient emphasis upon courses in economic and social sciences. These courses are new to them and many are giving them but slight attention. We are beginning to see that such an attitude is a mistake. I think it will be unnecessary in the course of a few years to emphasize the matter so forcibly. The man who is going out as an extension worker should have some understanding of problems in economics and sociology. Many of our answers approved of courses in educational psychology and methods of education. It appeared that anything like definite instruction under the head of extension organization methods and policy is not yet available, but that a few institutions now are organizing such courses. Under the head of graduate courses it appeared that many people are afraid of too much technical education. This means, apparently, that they fear the extension worker will take too many higher courses which are merely theoretical in character or which are framed with special reference to training research men.

In order to obtain the opinion of extension workers in the field on the subject, several county agents who had had no regular technical training were asked to express their attitude towards technical education. In almost every case they deplored the lack of such training. There is no doubt that there are now in the service a considerable number of successful extension workers who have had no technical training in agriculture, and doubtless there always will be employed a certain number of these men who have not taken regular courses of instruction in either schools or colleges. In most instances, however, we find that such men, in one way or another, have had exceptional opportunities to gather information on the subjects with which they have to deal, and that by their own study and observation they have trained themselves. However, we ought to meet the situation frankly. There is no doubt that in a general way we must insist that extension workers shall have a regular course in an agricultural college. That this is desirable will

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be more in evidence as extension work develops, for reasons referred to in the earlier portion of this address.

Farm experience, or practice in extension work after graduation, also is generally favored in replies to our inquiries. Farm practice and apprenticeship in extension work were favored by many and in about equal proportions. A considerable number were of the opinion that the extension worker should be prepared to a certain extent by being placed in charge of some definite farm project. Others thought that teaching was a good preparation for the extension worker and could be counted as practical preparation. Several of those who replied thought that experience in some commercial work, such as selling farm machinery, was a good preparation for an extension worker, and a few favored some experiment station work, particularly with the idea that the experience would enable the worker to get in touch with the experiment station activities, see what they really meant and how he best could make use of their findings.

E. A. Bryan. May I say a word regarding the matter of graduate study as a preparation for extension work or for agricultural teaching? Of course, additional study always is good and wholesome; but there is some danger lest we come too greatly under the influence of an idea characteristic of those who bask in academic shades, who sometimes think that nobody can teach unless he is a doctor of philosophy, or a doctor of the philosophy of agriculture.

Most college and university administrators now feel that in the selection of young men for teaching or research they must get those who have done a great deal of graduate study. I, for one, would not feel as strongly as this, because these are new subjects of a very practical sort. When I was a younger man, I used to look with some degree of fear upon a person who had won a degree of Ph. D., and who was a candidate for a position in my faculty, lest he might be one of those who had continued his graduate studies thus long because there was no very great demand for his services. I have found frequently, in my experience, that the brightest and strongest of the young men are so much in demand that oftentimes their graduate study is postponed for many years; sometimes they never get to it. Oftentimes the weaker and less vigorous continue to attend school because there is nothing else for them to do. Often there are other things which count in an education which really are quite as important as academic studies.

Do not understand me to suggest that it is unwise or improper to expect as time goes on that extension workers shall do graduate work. I repeat that it is always good and always wholesome. It is a good thing for the doctor of medicine and surgery to go back to the medical school and do more work, and so it is a good policy for the student of agriculture or mining or economics or what not to pursue further study; but we ought not to be forced too rapidly in that direction or to make too much of graduate degrees.

D. H. Hill of North Carolina. It is a pleasure to hear President Pearson emphasize the need of better English equipment for men who are preparing to go into agricultural extension or experimental work, especially into experimental careers. Some of our co-workers who are doing excellent observational or investigational work are spoiling their good work by an utterly inadequate presentation of their results. A slouchy presentation of a thought always suggests slouchy investigational methods. Agricultural teachers ought to join hands with English teachers in trying to get their men to be accurate and interesting writers. Bulletins and other research work

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have of course added value and added dignity when the thought is clearly, vividly set forth.

A DELEGATE. The authors of the papers to which we have listened occupy administrative positions. I would like to speak as a teacher. I have been teaching agriculture for 17 years. When I think of the preparation I had for that teaching, and begin to sum up the insufficiencies that were in that preparation, I feel that, although I had the best of teachers, yet the one thing that I lacked in all my teaching was good understanding. The subjects were sufficiently well presented and in sufficient number, covering the many varied aspects of agriculture; but did they give one understanding?

I was at work in the field one vacation morning when my college teacher, Professor Roberts, came up and asked what course I meant to take the next semester. I told him that I meant to take histology, and that that might lead me to take psychology, and that I did not know where that would lead me. He said, "Well, do you think in taking that course that you will get understanding?" That set me thinking just what he meant. I came to the conclusion that these technical subjects both undergraduate and graduate, would tend to give me a more comprehensive outlook on life, whether or not agriculture contributed to a man's understanding and to his judgment and to his capacity and interpretative ability. I trust that I may so teach that my students shall have understanding and judgment and perspicacity; that I may be able also to inspire them in such a way that they will come to believe that this great subject of agriculture is something worthy of their study.

A DELEGATE. Our men should be trained in diplomacy. They should be taught not to talk over the heads of their audiences; to be straightforward and not supercilious; to realize that in many important matters they know far less than do those they seek to instruct; to deliver the message they are fitted to deliver, acknowledging their ignorance whenever they should do so. Is the holder of a doctor's degree the better for it? Perhaps, and perhaps not. If he studies no further, he is outclassed as compared with the man who is of an observing trend of mind. If, however, with this larger knowledge and experience that has come to him, he studies yet further and keeps alive and up to date, the advanced degree is well worth while.

J. L. SNYDER. Dean Hunt's paper appears to advocate that a boy when he graduates from college should get a job and that he needs no graduate work. I consider that to be dangerous advice. We have at Michigan some good men who have done little or no graduate work; yet the strongest men in the institution have pursued graduate work, and I believe that theory will hold everywhere. We advise our young men to get more knowledge and more training. Many cannot do it until they have earned money. Many do well to get practical experience before taking graduate work. But if they are to succeed and to make the most of themselves, they must have much more training than they get in the undergraduate courses.

I have never seen a bright, capable fellow injured by graduate study. The poor student is improved and the capable man is made infinitely better. The enthusiast who talks and talks with little effect to his class rarely holds an advanced degree. On the contrary, one who has done graduate work successfully neither humbugs himself nor misleads his class. In the near future all those who teach the technical agricultural subjects will be required to have more training than that secured in undergraduate courses. I protest against the doctrine that graduate study is relatively unnecessary and undesirable. In my opinion we need to encourage graduate study to the limit.

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A DELEGATE. There is a young man at one of our great universities who is now losing just $900 a year on my advice. He received his bachelor's degree last year and was offered a position as assistant in county agent work at a salary of $1,500, a position in which he would have made good. He was offered also at the same time a position as instructor at $600, with half time for graduate work. He counselled with me. I said to him, "If you become assistant county agent, you will succeed and your salary will in time increase, I have no doubt, perhaps to $2,000. If you begin as an instructor at $600 and secure your advanced degrees, you will succeed there also. The thing for you to consider is where you will be twenty years hence and not the immediate result this next year. In my opinion, if you take the $600 position and do graduate work, your ultimate position in life will be far higher and one of far more influence than if you take the higher salary at the present time."

A. J. MEYER of Missouri. May I present an idea that I hope to see tried out in Missouri, trusting that it may have in it enough of merit so that other colleges may see fit to give it a trial? The idea is to assign graduate students to specific extension problems and have them work those problems out from beginning to end. Under the plan of study I have in mind, a student will be assigned to a preliminary survey—social, agricultural and economic—in the community where the work is to be done, so that he may frame his course to meet a specific set of conditions. He is then required to prepare a working plan of procedure, beginning at the beginning and giving a reason for every step. If there is to be an advance publicity campaign, he prepares the newspaper notices, posters, circular letters, handbills, pamphlets, or whatever printed or written matter is needed. If it is decided that charts, lanterns slides or permanent demonstration material is needed, he assembles such equipment. He prepares speeches or outlines of speeches if the problem involves speech making. Under proper supervision the whole problem is analyzed and reviewed in detail from every angle, from that of the technical department, from the editorial viewpoint, from its psychological aspect, if it has one. All demonstrations and addresses are actually given in the presence of an audience of competent critics.

After all this has been gone through with, the new worker is sent to the field to follow the plan he has worked out. He is called upon to check his work at every step, so that he may put cause and effect together, thereby obtaining the true measure of the success of his working plans. The problem is not considered as completed until he has made detailed follow-up observations to know whether he has really accomplished anything and just what he has accomplished.

If we had students scattered all over the land doing work of this kind we would not only train extension workers but we would assemble a fund of information on the professional side of extension work which is much needed and completely lacking. We need a vast amount of research work in extension methods and practices, some means of putting extension work on a scientific basis.

A DELEGATE. What should be the undergraduate preparation for graduate work along extension lines?

A. J. MEYER. Personally I stress the idea of making every extension worker something of a specialist, as much as it is possible to do in four years, which is not very much.

THE CHAIRMAN. May I emphasize what President Snyder has well said touching the need of graduate work? I do not hold that an immediate job

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is a vital matter. I would not have our young men misled by incorrect inferences. If we are to attract strong high school students we must keep agriculture on the same high plane that the other subjects occupy in our colleges and universities, subjects with which it has to compete. Unless our teachers in agriculture are as well trained as our teachers in zoology, chemistry, mathematics, the English language, German and the like, the strong men will be attracted to the strong subjects and the trained men will avoid agriculture. Now these students will get the inspiration from and be guided very largely before they reach college by principals and teachers. These high school principals and teachers will not go to a college to study agriculture after they have taken their master's degrees from Chicago, California, Yale or Harvard, if they have to sit at the feet of young men on whose bachelor's diploma the ink is hardly dry. They will have little respect for such instruction and will advise their strong students to avoid it because there is not much in it.

It is said that Lord Bacon collected all the books that ever had been written on agriculture, read them through, and then made a bonfire of them, saying: "In these books I find no principles; therefore they can be of no use to any man." We are now beginning to succeed in attracing strong men, and this is largely because our leaders, our research men, our teachers, are better trained than they were in the past.

On motion, the program committee for the next convention was requested to provide a round table discussion for the presidents of the agricultural colleges as such and another for the deans of the colleges of agriculture and engineering in the state universities.

E. E. SPARKS of Pennsylvania. May I say for the committee appointed to notify the Land-Grant College Engineering Association touching the action of this section in forming a division of engineering, that it called upon the Association in question and made its report. It was received with applause and every manifestation of pleasure. That Association will proceed to cooperate with the college section of this Association in organizing a division to be known as the engineering division of the college section.

The report of the nominating committee was then made by its chairman and, on motion, received and adopted (see page 154).

On motion, a recess was taken until 2 o'clock P. M., Friday, August 13.

AFTERNOON SESSION, FRIDAY, AUGUST 13, 1915

JOINT SESSION WITH THE LAND-GRANT COLLEGE ENGINEERING ASSOCIATION

The joint session was called to order by the president of the Land-Grant College Engineering Association, Prof. H. W. Tyler of Massachusetts.

THE CHAIRMAN. President Waters of Kansas will discuss "The Administration of Engineering Divisions of Land-Grant Colleges."

H. J. WATERS. Instead of discussing the details of the organization of an engineering college, I trust I may be permitted to make some observations growing out of an experience of about twenty years in the administration of educational institutions in general. Almost any sort of an organization with the right sort of a man will be successful and will last a long time. Whenever I have been fortunate enough to get the right sort of a man at the head of any phase of the work, I have felt that I could dismiss that part of the work from my mind, and let him alone and that he would always work it out, leaving me free to devote attention to phases less well taken care

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of. Without the right man, no amount of organization, no amount of attention, no amount of prodding, pulling and persuading, will serve. The man is the essential, the vital element. Then opportunity must be given him. Good men cannot be held today when they have to make their own opportunities. They will seek institutions that will provide opportunities. Some men can make their equipments and a few men prefer to do it. Some men can not use good apparatus if you give it to them. They prefer to make their own, crude, but efficient. A few such men have attained great distinction. I had the pleasure of working with a man in Germany who would not buy apparatus. His laboratory looked like a second hand shop. He was a great leader; but such men are very rare. However, in our educational institutions the best men are not apt to be satisfied to use home made equipment.

The only way successfully to administer a department that has a good man at its head is to let him work out his own salvation after you have provided the means. As to what constitutes a good man, what the specifications are, what the training is, what experience he must have had, that is another and a serious matter. No rules can be laid down. One man, with an amount of training that would be entirely insufficient for the average man, will be eminently successful; another, with training that is out of all proportion to that of the average successful man, will not succeed.

I hold that it is as important in engineering as in agriculture for the teacher to have had practical experience in addition to good training. I do not feel that graduate study is of as much importance in engineering as in agriculture. I believe that out in the great world of experience and activity is the place for him to round out his engineering education and prepare himself to be a successful engineering teacher. He must be made to be responsible for some phase of work. He should not merely visit the Westinghouse shops, look through them casually, see the things that are spectacular and interesting, and then go to some other shop somewhere and spend a few minutes in a casual excursion. We have that sort of thing in graduate work in agriculture and credit is given for it; but it is not serious work. The man in any of these lines of work must feel responsibility. If he designs a bridge he should see it built, see that it stands up and carries the load, see that it is built at a reasonable cost.

Nothing inspires a young man as much as to be located where there is a man who has done things, who has had large, successful, varied experience. Hence, I feel that the engineer should have the opportunity either to have a large practice on the side, or to get out during the year in vacation time and do things where things are happening; to get out of the classroom, the laboratory and the shop to places where large enterprises are under way, that he should become a part of them and not merely visit them. I have no faith in visiting, because I have done some visiting myself and know how it goes. We visit things that are interesting and do those things that please us; but when we are at work and get up at seven o'clock in the morning and answer the call of the whistle and punch the time-clock and feel responsibility for the outcome of the day's work, and that we are part of the organization, we are learning something about the work.

Hence it is that in the administration of an engineering college, just as in the administration of an agricultural college, I stress the practical experience of the men who do the teaching. If I could not get that sort of a man, I should insist upon the man I secured getting that sort of training before he was with me very long, and before he could expect any material advance in

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salary or position. Such a requirement is fair alike to the institution and to the teacher.

However, to get and to support such a man is not the only important administrative duty. The getting rid of men is sometimes quite as important. The business of the president or the dean is said to be that of hiring and firing; but it is not as simple as that. What are you going to do with a man who has been in the harness for a long time, who is now beginning to develop a double chin, who has to go to the tailor to get clothes to fit him, who has established an excellent reputation, who has a delightful family and a salary on which he can live in comfort and who is disposed to take things easily after he becomes forty-five years old? Many a man who has promised well at thirty-five is a failure at forty-five. How can he be awakened when he shows a tendency to go to sleep? Usually such a man has gathered his own graduates into his department, men whom he has trained, who like him and his habits and track along after him. Sometimes you can wake him up by placing one or two well-trained, practical, experienced wide-awake men in the department, giving them a chance to do things without being at all disloyal to their superior. But that does not always serve the purpose. Sometimes more drastic measures are needed; a leave of absence does good; a year in which to look around and see what other people have done and are doing. The teacher may then come back with a new vision. If that does not work, the only remedy is either to split the department and place a man next to him who will do things, loading the responsibility largely on the new man; or to split the department, giving the elementary work to the older man, letting the younger man handle administrative questions and be in charge of the assistants, indeed do practically all the work. Sometimes it is necessary actually to ask for a resignation, even after long service. I do not feel that an institution is under any moral obligation to keep a teacher after he had become inefficient. Its primal responsibilities are to its students, who should receive the right kind of instruction. If teachers go to sleep and fail to manifest red blood and new life, retire them in some way; but under no circumstances retain them on account of sentiment or for the sake of stability of the institution or because of long tenure of office. Sometimes stability is an asset, but often it becomes a liability. I have seen institutions where things were running too smoothly, indicating that they were running down hill. I maintain that a reasonable amount of change in the institution, if it is wisely directed, is the only way in which you are going to maintain its standard. That is particularly true of the smaller institutions that constantly are being preyed upon by the larger institutions. Under such circumstances a certain amount of change is inevitable. The larger institutions take the best men and those who are left are the least fit. If you cling to those who have drifted and nurse them along and keep them alive as long as you can with light work and slight disturbance and perfect peace of mind, you have the conditions for dry rot, for a dead institution.

The engineering colleges may learn much from the agricultural colleges and vice versa. In no department in our land-grant colleges is good teaching so prominent as in the engineering department. In my judgment the agricultural colleges do not begin to approach engineering colleges in the quality of the organization of their work and in the quality of training. However, the engineering colleges need to develop certain qualities in their men that the agricultural colleges develop to a high degree, more particularly sound judgment. Engineering education is inclined to be a little too exact and mathematical. Its votaries are too much inclined to set down a figure and

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work out the problem by logarithms or otherwise, and then afterwards to guess at it, because it is partly a guess after it is figured out and they have not been trained to guess. In agriculture students are trained to guess from the beginning, and, therefore, they become better guessers. To apply one's formula and then to throw it to the winds and to use common sense, is a fine and splendid quality in an engineer as well as in an agriculturist.

The engineers may well cultivate the wider and broader interest that the agriculturists take in affairs. The engineers have been trained primarily to think that a man is successful and is performing his duty if he is a part of a machine or an organization. They go out into a sort of a lock-step. Their vision should be broadened and the opportunity pointed out to them to run the thing instead of becoming a part of it. I fear that the engineering colleges have not felt their responsibility for the trend in the developments along industrial lines that the men trained in agriculture have felt for the trend of the development along their lines. They have not given their men the vision or the inspiration for leadership. They have been training men so earnestly in technical details that in part they have lost sight of the larger things. We need men of the larger sort in this country, for we face the situation now of taking over the world's markets of manufactured material. We shall have to lessen our exports of raw material and increase those of finished products; and to do this we need men capable of world leadership, men trained in world trade and salesmanship; and the engineers above all men ought to be qualified to assume such responsibilities.

When this war is over, and when the people who have been engaged in it make a crop so that they have something to eat, we may be hard pressed for something to sell in a foreign market. The demand for cartridges, for cotton with which to make explosives, for gasoline, for motor trucks and things of that sort, will have passed away. We shall not be in the food exporting business, granting a normal season, and we shall have to manufacture our own products. Our foreign exports have increased by leaps and bounds under the war stimulus. But all the material we are now sending will be useless; there will be no demand for it after the war is over and when the warring nations have a chance to make a crop.

We have been discussing as a mathematical proposition the trade situations in South America and in the oriental countries. We have not been able to take hold of that trade, very largely because we have not had the trained men at the head of engineering affairs. I repeat, the engineering institutions of this country ought to train their men for its large affairs; and we should shape the trend and development of our industrial affairs through our college graduates in engineering just as we are doing now in agriculture.

THE CHAIRMAN. Dean A. Marston of Iowa will discuss "Duplication in Engineering between Land-Grant Institutions and State Universities."

DUPLICATION IN ENGINEERING BETWEEN LAND-GRANT INSTITUTIONS AND STATE UNIVERSITIES

BY A. MARSTON

Duplication in engineering between land-grant institutions and state universities has received much criticism in recent years. In several states active movements have been started to do away with such duplication. A few of these have succeeded, while others have failed, but all have caused much turmoil and uncertainty in higher education in the states affected.

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Every institut on represented in this Association is deeply interested in this question. Indeed the very existence of important departments of their work may be said to be at stake. In the 22 states and territories where the land-grant institution is united with the university, the state universities have essentially the same interests as the 28 separate state colleges, though not in such vital degree.

The original interpretation of the Morrill Land-Grant Act, the repeated endorsements of Congress given in additional legislation, and 40 years of practice have combined to establish engineering so firmly at the land-grant institutions, both separate and combined, that in 1909 the Association of American Agricultural Colleges and Experiment Stations was unanimous in adopting an official resolution, stating "that it is the sense of this Association that the national laws which constitute the charter of the land-grant colleges distinctly prescribe work of collegiate grade in agriculture and mechanic arts, including engineering in all its branches and the sciences related to the industries, irrespective of whether the colleges are established separately or as parts of universities".

While the land-grant institutions of all the states and territories would be seriously injured by an interpretation of the Morrill Act which would exclude engineering, there are only 17 states and territories in which engineering instruction has actually been offered at a land-grant college and also at a state university. In Oregon and Montana this duplication has now ceased by the elimination of engineering from the state university curricula. In Kansas and North Dakota, following an investigation by a central board, instruction in engineering has been continued at both institutions. An attempt made by the Michigan legislature to limit the annual expenditure for engineering at the land-grant college to $35,000 has been declared by the State Supreme Court to be unconstitutional. In Iowa the State Board of Education attempted, without success, to co-ordinate the three state institutions of higher learning. The elimination of engineering instruction from the state university curricula was one of several important features of its plan.

The discussion and agitation concerning duplication in engineering instruction have been much too narrow in scope and too partisan in character. Institutional rivalry has too often furnished the real motive. Decreased state expenditure, which has been made prominent in the argument because it interests the voter, is not the only or the most important matter to be considered in connection with duplication, or any other educational question. The "educational experts" who have so complacently addressed themselves to the subject have woefully failed to realize the vital connection of duplication in engineering with the vastly broader and bigger question of an adequate national mechanic arts educational system.

The real question which should be decided in each case is not merely whether a state should maintain two engineering schools, but how many and what kind of engineering schools are needed to meet its present mechanic arts needs and probable future develpoment. Private as well as state engineering schools should be taken into account in determining this question. The eight strong New York schools and Pennsylvania's seven should be considered in deciding how many engineering schools should receive state appropriations from these commonwealths.

Moreover, duplication in engineering between state supported schools is not confined to the land-grant institutions and state universities. New Hampshire appropriates to Dartmouth, as well as to Durham; Vermont to Norwich as well as to the University of Vermont; Massachusetts to the Worces-

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ter Polytechnic Institute as well as to the Massachusetts Institute of Technology; New York to Alfred University and to Syracuse as well as to Cornell; Pennsylvania to the University of Pennsylvania, to the University of Pittsburg and to Temple University as well as to Pennsylvania State; Ohio to Ohio University as well as to Ohio State University.

Probably the most startling instance of duplication in engineering in the United States, if not in the world, is at Schenley Park, Pittsburg, where the University of Pittsburg and the Carnegie Institute of Technology maintain full fledged, independent, rival engineering schools *on the same campus*. The latter, established much later than the first named, is a quite complete mechanic arts institution, maintaining separately mechanic arts work both of engineering and of trade school grade. The facts in this case certainly tend to show how essential engineering is to any strong mechanic arts college.

For many years the engineers at land-grant institutions have been indebted to their colleagues in agriculture for loyal and effective support against attempts to nullify the provisions of the Morrill Act which call for college grade (or engineering) instruction in mechanic arts, on a par with that offered in agriculture. Evidently duplication in agriculture at state institutions of higher learning, as well as in engineering, is now a possibility to be reckoned with in the near future. It is understood that the Illinois State Normal University uses a 195 acre farm for agricultural education purposes and offers a four-year collegiate course in agriculture with high school graduation entrance requirements. The Iowa State Teachers College and State University now offer agricultural instruction to teachers, the latter in summer session only. In fact, certain Iowa denominational colleges have been endeavoring to secure state appropriations wherewith to introduce agricultural work.

Agricultural education is now passing through the same phase which engineering experienced years ago. Once despised by orthodox universities and colleges, it is now coveted because of its great development, and especially because of its great popularity. We shall soon be hearing that the atmosphere of a university is essential to real college work in agriculture, that the Morrill Act contemplated only trade school agricultural work, and especially that agriculture is essential to a real university.

It is high time that the question whether or not another state institution shall offer the engineering instruction which is required at land-grant institutions by the terms of the Morrill Act shall be determined by the mechanical and agricultural needs of the state and not by the desire of partisan alumni for large appropriations and for increased student attendance at their Alma Maters.

The engineering schools are the natural leaders in an adequate national system of mechanic arts instruction. They have a most important part to play in the development of the mechanic arts and agricultural industries of the states, and they should play well their parts, bearing in mind the German official statement that "industrial failure is threatened when the schools, instead of serving industry, merely serve their own purposes". *

Mechanic arts is a broader term than engineering. Engineering is included in mechanic arts, and constitutes its professional side. The mechanic arts are those arts which are characterized by applications of the science of mechanics. The term is not derived from the term mechanics as applied to artisans, but both terms trace far back to the distinction made by the ancients between mechanical science and other science. Educationally, the term

*Third report Royal Prussian State Industrial Office, U. S. Commissioner of Education, Report for 1910, Vol. 1, p. 300.

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mechanic arts includes engineering, engineering extension, and engineering experiment station work, together with such limited sub-collegiate or trade school work as proves feasible at a college serving a state.

Increasingly agriculture is becoming an industry requiring a high development of engineering. The Morrill Act wisely provides for the closest association and cooperation at the same institution of college education in agriculture and in engineering. Such association is helpful both to agriculture, which needs a special development of engineering, and to engineering, which finds in agriculture and in the needs of agricultural communities some of its greatest fields of usefulness.

The profession of engineering ought not to be looked upon as a closed caste, whose members perform mysterious operations beyond the comprehension of the most skilled mechanic. It is the professional branch of mechanic arts. Engineers are officers in the great industrial army, and should share fully the efforts, the hardships and the triumphs of their comrades of the rank and file. This is the very spirit of the land-grant institutions, the ideal toward which the people of the United States struggled for half a century, until, while under the inspiration of the great war for union and freedom, they succeeded in embodying their wishes in the Land-Grant Act, in inspired terms, definite and yet wisely broad. To remove engineering from the land-grant institutions would work an incalculable injury to mechanic arts and to agriculture.

The only legal and practicable way at this late day whereby duplication in engineering at a lang-grant institution and at a state university may be obviated is to eliminate it from the university curricula. The writer neither advocates nor decries such a step. The decision should be reached only after a very careful and broad study of the circumstances in each case. Private engineering schools should be taken into account; the present and future development of mechanic arts and of agriculture should be carefully studied and generously provided for. Undoubtedly there are states where duplication should continue, as in Michigan for example, and others where the engineering instruction should be given at the land-grant institution alone.

It is useless to expect to eliminate this duplication in engineering in any state without the entire cessation of all engineering instruction at the one or the other institution. All suggestions to the contrary are either entirely impracticable, or involve the retention of practically all the undesirable features of duplication while at the same time sacrificing its advantages. Three of these futile suggestions may be considered at some length.

First. It has been suggested (but not by competent men of actual sympathetic experience in agriculture or in land-grant college instructional work) that the mechanic arts instruction at land-grant institutions should be restricted to work of trade school grade, while the strictly engineering work is done at the state universities. Restriction to trade school grade of the agricultural work, also, would follow as a necessary corollary. This suggestion evidences inability to understand the essential character of trade school education.

In the first place, the trade school must be essentially a local school. Its students are boys of 14 to 18, who should live at home, and mechanics who must work at their trades for a living while studying. Again, the trade school must serve students by the hundreds of thousands. Clearly no single trade school can serve a state. A whole system of trade schools is needed in each state. It is estimated that the German trade schools ought to train at least ten highly educated mechanics to each graduate engineer. Finally, the Morrill Act specifically requires mechanic arts work of "college" and "professional"

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grade, and constitutes the irrevocable Magna Charta of the land-grant institutions.

Second. It has been suggested that the engineering schools at the state universities should become "graduate" engineering schools, that is with entrance requirements of graduation from a liberal arts college, and that the engineering schools at the land-grant institutions should be restricted to present entrance requirements. The curious thing about this suggestion is that neither in engineering equipment nor in faculty, nor in any other feature of engineering education would it eliminate duplication. The only essentially graduate feature of the proposed university engineering school would be its entrance requirements. Its engineering instruction would be the same undergraduate work taught at present, in fact the same taught to engineers all over the country, at land-grant and all other engineering schools. Even the general, fundamental work (which, curiously enough it is proposed should be removed from the university instead of from the land-grant college) would still be offered at the university, in its liberal arts college, as well as continued at the land-grant institution. Parenthetically it may be said that it is misleading to term engineering schools which teach mainly undergraduate engineering work "graduate engineering schools", even though Harvard and Johns Hopkins adopt this nomenclature.

College entrance requirements up-grade as the years go by. Colleges of engineering and of agriculture today ask for many more units than they sought 50 years ago; and in the near future it may be necessary to the proper education of engineers, and of professional, scientific agriculturists as well, to insist that entrance requirements for all collegiate engineering and agricultural courses be equivalent to graduation from a present day liberal arts college. If this should eventuate, the land-grant colleges must then be free, as it present, to maintain their standards as high as progress in the industries and in education shall require. To permit them now to be jockeyed out of the right and opportunity to grow with mechanic arts and agriculture themselves would work an irreparable injury alike to the industries and to the institutions.

Third. It has been suggested that the various engineering courses might be divided between the land-grant institution and the state university, so that no one course shall be taught at both, a suggestion reminiscent of King Solomon's decision in the dispute over the baby. Its fallacy is evident. All the engineering courses are but branches of one profession. A large percentage of the work is practically common to all branches and the same equipment and faculty which are required for one strong course share extensively in the work of the other courses. The fundamental work in mathematics, sciences, etc., common to all engineering courses, amounts to 30 to 40 percent of the total. All properly educated engineers must receive training in drawing shop-work, mechanics, surveying, machinery, electrical engineering and in other technical subjects common to all engineering courses. Any school equipped to train and graduate properly educated engineers in any one course, will necessarily have such a large amount of the equipment required for other engineering courses, and so many graduates of other engineering courses in its faculty, that it can add other strong engineering courses at small additional cost, and ought to add them in the interests of educational efficiency.

One state has actually attempted this fallacious plan in the extreme, seeking to limit the engineering instruction at the land-grant college to agricultural engineering. This action seems to the writer not to be lawful, for agricultural engineering was not even thought of in 1862, and most certainly does not ade-

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quately provide the mechanic arts instruction required by the Morrill Act. But if this institution properly educates its agricultural engineers (for whom it offers a professional course) it must give them the same instruction in mathematics, English, chemistry, physics, mechanics, materials of construction and other fundamental subjects which is necessary for civil, electrical and mechanical engineers. It must teach them most of the surveying, drawing, irrigation engineering, drainage engineering and highway engineering required for civil engineers. It must teach them much of the shop-work, machine design, factory and power engineering required for mechanical engineers. It must certainly train them in the principles of electrical engineering, for the use of telephone, electric power and electric lighting on farms is increasing enormously.

In short, when the state college in question has provided the engineering equipment and faculty already furnished for the education of agricultural engineers in competing sister institutions which carry other engineering courses it will also be prepared at very small additional cost to offer strong courses in civil, mechanical and electrical engineering; and it ought to do so, and, sooner or later, will be directed to do so by state authority.

In brief, in no way can duplication in engineering between any two good schools be eliminated except by eliminating all engineering instruction at once. Any other plan is as futile as to attempt to kill a healthy willow hedge by trimming its branches.

There are some arguments in favor of duplication. The ideals of the land-grant college engineering school are most closely identified with the great mechanic arts industries, with agriculture, with research for the industries, and with the general dissemination of engineering knowledge among the people. Those of the university engineering school are more closely identified with the ideals of the older recognized professions of law and medicine. Perhaps it may be wise to emphasize separately both classes of ideals among a state's engineers. Where two state engineering schools are maintained, a healthy rivalry may sometimes stimulate both, but on the other hand it may become so intense as to be unwholesome. If there are two schools, classes tend to be smaller, with correspondingly closer personal contact of professor and individual student. On the other hand, it is claimed that the cost of engineering instruction per student is considerably greater in two smaller schools than in one large institution. Reliable statistics on this subject have never been collected. In one state maintaining two state engineering schools, engineering salaries are $100 per annum per student at the school which has 738 engineering students and $149 at the one with 213 students. Other causes than size, however, may affect such comparisons, at least to some extent. Of course, there is a large saving of initial cost and of upkeep of the engineering equipment, many expensive items of which are essential, but are in use only a fraction of the time at a small school. The engineering equipment for a large and strong present-day engineering school may cost as much as a million dollars; and efficiency in this line is evidently important.

The writer pronounces neither for nor against duplication of engineering instruction at land-grant colleges and state universities as a general principle; but he does call for a full study of the question from the broadest point of view in each case, especially the point of view of an efficient and adequate national system of mechanic arts education. Without doubt the Morrill Act prescribes that engineering shall be taught at the several land-grant institutions. Furthermore, the engineering there taught is so essential so the adequate development of the mechanic arts industries and of the agriculture of each state that its elimination from the curricula would work serious injury throughout the

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Nation. The Association of American Agricultural Colleges and Experiment Stations has spoken clearly on this subject, and should aid its constituent institutions in every state where the issue may be made.

J. M. HAMILTON of Montana. This question is a local one depending upon the demand for engineers, the state's wealth and the population. We settled it two years ago in Montana. We have a separate school in Butte which offers mining engineering. It is a very technical school and teaches no modern language, very little English, history or economics, practically nothing but engineering subjects and the applied sciences like physics, geology and chemistry. There are only a half million people in Montana and from $350,000,000 to $400,000,000 worth of property. Such are the demands for different kinds of education that it is almost impossible to meet them. We have only state tax-supported colleges. We have been discussing this matter for several years out of one another's sight. I have been connected with it for more than a quarter of a century, a third of that time as a member of the board, part of that time as a member of the faculty of the state university, and the remainder as president of the land-grant college. I have had but one opinion during all this time, whatever my situation has been and wherever I have been, and that is that Montana, in view of its limited population and relatively small financial resources, cannot afford to support two engineering colleges doing the same work. Rivalry, of course, was sharp. If one institution attempted to secure a building, the other would not be particularly enthusiastic about it, to state the case mildly. When we would get a legislative appropriation for an engineering building, let us say, the State Board of Examiners—the state's financial board—having the power to hold up any appropriation, held it up. Perhaps, the next session no appropriation whatever would be made. Finally we took the bull by the horns and settled it. We have threshed out the question of institutional consolidation during the last two or three years, once before the legislature and once before the people. Both verdicts were against consolidation and in favor of the present policy of supporting separate colleges and of maintaining at Bozeman a technical institution.

Of course, certain fundamental courses, for example English and mathematics, must be taught at both institutions. However, many of these classes are so large that they have to be subdivided anyhow, and this duplication is not more expensive than would be the case if we had only one institution.

H. J. WATERS. The duplication in engineering institutions is the least inportant evil created by the multiplication of institutions. Indeed, it is a waste of time to discuss duplication in a single subject, like engineering. The vital question is: How many young people is a state going to educate? That is what ought to determine the number of institutions a state shall maintain. If both a land-grant college and a state university are maintained, the number of young people it is educating is practically doubled. Iowa has two institutions, yet its population is somewhat smaller than that of Missouri which has but one. Separate institutions are unnecessary unless the state deliberately determines to educate a large number of people. The state university develops just as if the other institution never had been established. That statement is proven by statistics. I am told that fifty percent of Harvard's students live within a radius of fifty miles from Cambridge; and certainly there is no more cosmopolitan institution in America than Harvard. It is, therefore, essentially a local institution. And that is true throughout the country, true of educational institutions throughout the

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world. The real question before us is, how many of your youth do you want to educate; and when you have answered that question, you will have determined how many institutions you want to carry.

F. A. THOMSON of Washington. Washington is getting into the limelight in the matter of duplication. Let us consider the matter historically. What was the status of the two institutions in 1892 when the state college opened its doors? The State University at Seattle offered three courses leading to a degree, the classical, the Latin-scientific, and the English-scientific. The State College at Pullman offered courses leading to degrees in agriculture, horticulture, mining engineering, mechanical engineering, civil engineering and electrical engineering, and a year later added courses in chemistry, botany, zoology and pharmacy. Today, twenty-three years later, the curricula of the two institutions are practically identical, save that the university has a law school and the state college has not. The duplication of work at the two institutions is now the subject of legislative inquiry.

My personal point of view is as follows: Our land-grant college is a strong one, fulfilling in large measure the requirements of the Morrill Act. Our state university has become a very strong institution, offering practically all of the work the state college offers, with the sole exception of agriculture which is taught in its summer school, the courses being handled by a graduate of the state college from its department of economics. The university is located in a city in which are great industrial, manufacturing and engineering enterprises. If, as the result of the deliberations of our legislative commission, the engineering courses at the state university were eliminated, privately endowed schools located within a stone's throw of the university would be promptly established.

Washington is large enough and populous enough to support two good vigorous state institutions, both of them teaching engineering. In one respect we are differentiated from the states further east, in that there are practically no private or endowed colleges within state borders.

A DELEGATE. We face this problem of duplication and the outcome is doubtful. In the younger and sparsely populated states, sometimes it is hard to get enough students. Consequently it is the custom in many Western states to seek the students instead of letting them do the seeking. In the East I was impressed as a student that a college education was a great privilege and that if I wished to stay in college I must be a good boy. In the West, we let them know that we are very glad if only they will come to us. I lament the situation. It has its disadvantages. In the early days it was difficult to persuade students to study agriculture, relatively easy to get them to study engineering. But after about two years' work in higher mathematics, many of them discovered that they were not likely to shine as engineers. During those two years they got some notion touching agriculture, heard different points and problems discussed of which they never dreamed, problems which their fathers did not know existed; and as a result many of those fellows would turn to agriculture, taking three years in which to finish. In those earlier days three-fourths of our agricultural graduates started as engineers, and all but two of those who started in agriculture and graduated therein were city boys.

Now our agricultural course contains more students than does any other course in the institution, and they are a very high class of students. Our farmers now appreciate some of the work we are doing and are sending their boys and girls to us.

On motion, the joint session adjourned.

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SECTION ON EXPERIMENT STATION WORK

AFTERNOON SESSION, WEDNESDAY, AUGUST 11TH, 1915

The section was called to order by the Chairman, E. A. Burnett of Nebraska.

THE CHAIRMAN. This afternoon's program deals with experiment station publications. R. H. Forbes of Arizona will discuss "The Annual Report."

R. H. FORBES. The annual report is mandatory. We must report to our authorities touching the usage of the Hatch fund, and with even more particularity as to the Adams fund. We often have to report to our Governors, to the Presidents of our colleges, to our Boards of Regents and last, and most important of all, we must report to our constituent public. Since we must report so often and so variously it behooves us to report as gracefully and as effectively as possible. And the question naturally arises as to what constitutes a good annual report?

Annual reports are of three sorts. In the first place we have a purely fiscal report, written to comply with the law and containing very little, if any, additional information; for instance, the Illinois station report. Then we have very bulky reports of many hundreds of pages, such as the New Jersey and, formerly, the California reports. Several practical difficulties arise in the way of issuing reports of such magnitude. The expense precludes the poorer and smaller stations from printing them, especially if the mailing list is large; printing facilities are sometimes lacking; furthermore, busy people are not apt to read bulky documents, indeed, will not even search for the few pages that would be likely to interest them. It is on these accounts, I believe, that few large reports are now published. And, finally, we have the more usual style of report containing from fifty to eighty pages.

Now what can be placed between the covers of a fifty to eighty page annual report? In the first place a general statement should be made of the agricultural conditions within the field to which the report relates. In Arizona, conditions on the watersheds and the water storage that has resulted for use in agriculture are worth embodying in such a report; also rainfall and its relation to the live-stock industry and the grazing ranges; new and promising ideas as to crops; information as to crop epidemics and diseases and the like; market conditions affecting the disposition of these crops; storage and transportation problems; in short the preliminary matter should deal with a general survey of the agricultural situation.

This should be followed by an occasional restatement of the institutional machinery used in working out the various problems arising in the agricultural field. Rapid changes are now taking place in this institutional machinery, because of the extension activities brought about by the operation of the Smith-Lever Act. We need to revise our knowledge and understanding of the situation from time to time lest we wrongly understand the nature and the future effect of these new items of institutional machinery. We need to know the edged tools with which we work in the agricultural field.

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Summary statements relating to business affairs of the stations naturally enter into the makeup of a report. The station records become very bulky in the course of time, and administrative changes bring about losses of records and of information. Many of the important occurrences in a station's history may be forgotten. Therefore the history of the station personnel should be systematically recorded from year to year. Its publications should not only be listed but epitomized so that the outside reader, in judging its work, personnel, resources and literary output, may readily find the information he seeks and not be compelled to dig it out of an accumulation of bulky records.

The financial statement is important. It is usually simply a skeleton statement issued in conformity with the federal regulations. This sort of statement is interesting chiefly on account of the information it does not contain. We learn little from such financial reports as to a station's segregated expenditures. A legislative committee seeking to know how funds appropriated for certain purposes have been spent, does not find it illuminating. It is capable of vast improvement. May I refer to the form we publish at Arizona? It is a three-page folder, containing in brief practically all of the information that an auditor of accounts requires or that the various authorities and contributors of funds desire. For instance, we state how much is spent for administration, for agronomy, for animal husbandry, for horticulture, etc. It enables one quickly to answer inquiries from members of the staff who want to know what they are receiving for their work. It guides the director in budget formulation. The different Adams fund projects are individually stated so that one can determine exactly how much money is spent on a particular project during the year. It is exceedingly convenient and useful. We have a railroad appropriation. If the railroad wants to know what we are doing with its money, we can show to just what uses it was applied. In certain irrigation investigations the expenditures made for machinery, for electrical apparatus and other purposes are clearly set forth. The expenditure of the state appropriations are similarly detailed. Such a statement satisfies every inquiry of the federal departmental officials, of staff members, of the railroads, of research workers, of legislative committees and of the public in general. Indeed, such an annual financial statement proves to be a powerful argument with the various influential people from whom we seek funds. I do not see how any station gets along without such a financial statement.

Yet more important is the annual review of the progress of research work. Sometimes the station director reviews the station's scientific activities. This is done for instance in Wisconsin and in California. This method doubtless is most effective where there are large forces of workers, for it is no small task to secure, to edit and to coordinate twenty reports from twenty different men. But at stations where only limited numbers of scientific workers are engaged, it seems entirely practicable to secure statements from the several workers and incidentally to require them to search their own souls and sit in judgment on what they have done, the whole being edited to secure a measure of uniformity.

The annual report often proves a convenient catch-all for the material which cannot be conveniently published elsewhere; for items which are, perhaps, too short to make a circular, and out of place in a more extended publication. These thus become matters of record and available for such use as others may wish to make of them.

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There is woeful lack in many cases of literary finish in station publications; and this fault is often and justly criticised. The occasion and necessity for finish and excellence in literary composition is just as great in the case of agricultural publications as with educational publications of any sort. This includes such matters as literary style, logical arrangement within the publication, punctuation, etc., all of which has so much to do with the availability and readableness of the material. And, finally, some of the more isolated stations experience agonizing difficulty in securing satisfactory printing.

Summarizing, I should say that the possibilities of an annual report are considerable. The report should contain an occasional general review of the field of operations; a re-statement from time to time of the institutional machinery with which the work is accomplished; a catalog of interesting and useful items of station business; a history of its publications and personnel; a detailed financial statement that conveys some real information; and, most important of all, a scientific review of the year's work. If properly prepared and edited, a dry, perfunctory public document may be transformed into a juicy, nutritious and interesting piece of administrative literature.

P. H. Rolfs of Florida. I query whether it would be possible to condense the material Director Forbes has outlined within eighty or, indeed, one hundred and twenty pages; yet eighty to one hundred and twenty pages is as large an annual report as the smaller stations can afford to publish. The Florida station works almost entirely on the two federal funds. We have difficulty in securing money enough to publish our bulletins and reports

The papers published by the staff will fall into three classes: technical, semi-technical and popular. Technical papers, such as are acceptable for publication in the Journal of Agricultural Research, should be reviewed in the annual report wherever practicable, the author preparing the review, since an editorial review is often not satisfactory. If the technical paper contains a summary, this is often suitable. The semi-technical papers can usually be noted by a brief summary, while the popular articles and papers need no mention as a rule, excepting that important ones might be mentioned by titles.

We could accomplish much good for the stations as a whole if the rest of the world could know more about the problems we are investigating. Why should we be secretive in this matter? Occasionally advantage may be taken of the open door system; but what of it? There is plenty of room, there are plenty of problems. The scattered workers thus can get in closer contact, either by personal conference or by correspondence. In the Southeast and Southwest the stations are widely scattered; in the Northeast they are near neighbors to each other and to many other scientific institutions. Their difficulties are less in respect to isolation than ours.

No piece of station work is more irksome than the preparation of an annual report. The writer is always full of his subject and works with zeal. He forgets the passage of time, often expects to prepare for publication in a sort of offhand dictation to a stenographer the work of eight or ten months, and then turns his copy in for the editor to construct into the finished product. More time should be used in the presentation of the results of research in order to enable the several workers, and the director in particular, to know just the condition of the work, and just how the workers' minds work. Brief statements as to the problems are of great assistance, not only to the executive but still more to the research workers. If a problem is worth while at all, its study will

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extend over several years and requires an annual review at least by the investigator to keep him from getting lost in side issues.

Many annual reports are issued hastily, this condition applying more particularly to the individual papers. Bulletins, however, even those written by the same author, are apt to be more carefully constructed. This shows clearly that the writer can prepare an accurate and grammatical manuscript. However, when it comes to writing an abstract for the annual report, it is looked upon as an irksome task, a necessary evil, to be hurried up and got over with. I emphasize the point made by Director Forbes as to literary finish. Station workers should be more careful in preparing articles, should scan their field carefully and sit down to write when their digestions are working well and they are in a thoughtful frame of mind.

Director Forbes has suggested that the annual report should be the repository for papers of an unusual character. Some experiments result negatively. Their value may be nil for ordinary bulletin purposes and great to other workers, and properly may be included in the annual report.

THE CHAIRMAN. In the absence of Director H. G. Knight the paper on "Bulletins" will be read by President Duniway of Wyoming.

BULLETINS

BY H. G. KNIGHT

No attempt will be made in this paper to discuss all classes of published matter entitled bulletins issued by the various agricultural experiment stations, but only those which are numbered serially and are recognized by the Office of Experiment Stations as official experiment station bulletins. Neither will the discussion attempt to cover more than a few general phases of the subject. Even official experiment station bulletins are so varied in character, depending upon their purpose and subject matter, that their detailed criticism would be a burden. Then, too, the value of such discussion is minimized in review of the developments of the past two or three years.

One of the provisions of the Federal Act of March 2, 1887 establishing agricultural experiment stations is "that bulletins or reports of progress shall be published at said stations at least once in three months". The writer presumes that it was expected that in this manner the public would be informed as to the progress of station work and that the station worker would be kept from sloth and ennui. This desired result has not always been secured. Often it has happened that ill-equipped experiment stations have published prematurely and have issued material which would not stand the acid test of time. Remarks have been made such as "it is your turn to publish" or "a bulletin should be written outlining the results of work in your department"; remarks made without any intimate knowledge on the part of the station administrator as to the true situation touching the progress of the research in question. Such expressions are depressing, not to say insulting. The importance of the problem and stage of progress of the investigation, the support which had been given the investigator, were not the questions at issue. The Hatch Act demanded four bulletins annually and four must be published, according to the misguided director, in order not to lose caste with the Office of Experiment Stations, or, possibly, to imperil the certification of the station to the Secretary of the Treasury.

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Quick results were desired because four bulletins must be published; hence problems which required long and arduous research were not sought, except by men who stood much alone among their fellows and were willing to undergo criticism. However, this situation now has changed altogether, and for the better.

Many station bulletins seem to be dual in purpose; to appeal at once to scientist and to farmer; to record evidence in much detail and to state conclusions for the one, and tersely to express the gist of the matter for the other; to be at once technical and popular. The minute analysis of the problem is needed by the scientist who reads, weighs, and criticises; broad and sweeping conclusions, clear and positive statements, delight the lay reader. Such a bulletin is hard to write if it is to be a success. There may be dual purpose horses built for speed and for work and dual purpose cows, good alike for milk and beef. If these exist, they are at best but compromises; and so is a dual purpose bulletin, neither fish, flesh, nor good red herring. Its author hardly can hope to please both scientist and laymen. A scientist reader must be able to follow every step which justifies the author's conclusions, in order that he may criticise, or if he desires, repeat the work, or, indeed, plan further research upon the foundation thus laid. Details which seem inconsequential and confusing to the layman must be discussed painstakingly. On the other hand, the everyday reader desires practical information. He wants the concrete facts set forth clearly and concisely. He is not interested in the advancement of research work or in the abstractions of science, but in their applications to practice, in the dollars and cents phase of the matter. The scientist may read the popular presentation in the bulletin as a matter of general interest, but probably he will not; the layman is frankly contemptuous touching the technical matter.

Some experiment stations have met the situation squarely by publishing two series; technical papers which are not distributed generally, and popular issues based upon the technical publication and sent to the mailing list. However, the results of research cannot always be set forth satisfactorily in this manner when the funds are limited, as in the case with many Southern and Western stations. Furthermore, the issuance of technical papers in the scientific journals sometimes is unsatisfactory from the standpoint of state support, for the material thus issued cannot be made accessible readily to the state clienteile unless the papers are duplicated in such station publications as the annual reports.

However, in two respects the situation has changed within a couple of years. Extension service bulletins and circulars are occupying much of the field covered earlier by the compiled station publications, and the "Journal of Agricultural Research" is becoming the repository of much purely scientific material. The popular publications of the extension service discuss multitudinous subjects in the light of the advanced ideas and research results obtained at the experiment stations. Their numbers bid fair to be legion. Surely they will be more widely demanded by the general public than the usual experiment station bulletins, for they are written to meet a demand which the station by the very nature of its purpose can not satisfy. Its business is the solution of problems, many of which may be disconnected and throw only side lights upon a great general field. The extension service, however, blends these solutions and fits them for popular consumption. The station as a rule can publish only its own work; the extension service can harvest its grain anywhere in the wide world.

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Until of late the experiment stations necessarily have been doing much work of a purely extensional character, work which now must be handled by the extension service. As one director writes, "the extension department is taking over part of the work which the station has done for 38 years". Several stations conduct demonstration farms. This is now an anachronism. This work belongs to the extension service and its prosecution tends to impair the proper work of the station. From a purely business standpoint such an organization is neither desirable nor efficient. Edison finds it better to stay in his laboratory and to leave to especially organized departments the business of demonstration than to set himself at the latter task. An institution organized and conducted primarily for investigational purposes cannot fail to find it difficult to maintain the full tide of its research enthusiasm when other interests distract, interests which in the last analysis often prove to be prime objects in the minds of those employed to do research. In such circumstances the research features may become of secondary importance. The writer fully realizes that conditions and traditions vary widely in the several states; but without doubt this situation has a vital bearing upon the character of the publications which are issued by the different stations. If the station's activities are not confined solely to work strictly of a research character, it must be expected that some of its bulletins will reflect the effects of this technical work. If it carries on certain phases of extension work, its publications will probably proclaim the fact. Until metes and bounds are clearly defined, it will be somewhat difficult to outline a policy in this direction.

The station has command of the research field in the agricultural college cosmos. To whom shall its knowledge be purveyed? To the scientist represented by the research workers throughout the world-wide field, to be used as a basis for further research? To the extension worker in order that it may be worked over and blended? Or directly to the farmers for their benefit? Shall it be given first to the men who are building the machine or the men who are to use it? The one is interested primarily in underlying principles, the other in their application. It would seem that the nature of the subject matter of a given bulletin should have bearing and be the determining factor. If the results are of such a nature that practice readily may be based upon them, the evidence and conclusions should be given directly to the reading public. Yet it must be remembered on the other hand that any discovery which may have a direct beneficial and practical bearing is quickly made a subject of propaganda through the press and by the extension service. If the bulletin omits detail, if all the evidence is not set forth, it may not withstand criticism. Yet, on the other hand, surplus of detail wearies the lay reader. The devil or deep sea; the lady or the tiger; the scientist or the layman! Duality of purpose rarely avails, and the wise station administrator steers clear thereof.

Sometimes a limited amount of research has kept afloat an unlimited quantity of compiled and even of text book material. Such publications have passed current as experiment station bulletins because of the modicum of new material they contained. Are such bulletins proper station publications in this year of our Lord, 1915? Not many bulletins nowadays go to this extreme, but only the station administration can gainsay their further issuance.

The experiment stations "stand to lose" in two directions. The extension publications on the one side of right are occupying the field which the station covered of old when there was no other organized agency capable

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of doing it, and when, for political and publicity reasons, it seemed necessary for the station to do it. On the other side, the Journal of Agricultural Research is publishing technical articles contributed from the stations. However, it accepts only papers of the highest type, which bars much of the material they issue.

The stations were established to aid in acquiring and diffusing among the people useful and practical information on subjects connected with agriculture and to promote scientific investigation and experiment respecting the principles and applications of agricultural science. It has been necessary during the process of developing a science of agriculture to lay much stress upon the diffusing of knowledge, not only among scientists but also among those who were making a livelihood by tilling the soil; but emphasis now can be laid on acquirement and to the station's younger sister, the extension service, can be left the task of diffusion.

Generally speaking, experiment station bulletins nowadays are of better tone and are more scientific in character than in earlier years. Increasingly they exhibit the results of research discussed in detail and contain less compiled material. Papers of more than state interest reach the editors of the Journal of Agricultural Research and of other technical journals; results of research which have direct value to the layman are published as bulletins, somewhat popular in character, and are sent to a rather large mailing list; and technical papers of local interest are sent to smaller lists or even confined to the official list.

The writer believes:

(1) That the greatest good of the greatest number should be sought; that there should be no conflict of interests; and that the publication field of the extension service should be defined clearly.

(2) That the bulletins containing the research should set forth the evidence in full.

(3) That popular bulletins giving the results of research should be published by the experiment station when the material may be of direct use to the layman.

(4) That recourse should be had to the Journal of Agriculturel Research and to other technical journals when the material is of general scientific interest.

(5) That limited editions should be issued in bulletin form whenever material is at hand which is largely of a local interest, and which has little practical bearing. Much good research material has been lost because of limited interest and of the fact that the notes taken were not systematized and published. A station worker often gains ideas and develops important results from observations, which, when taken, apparently were of little importance.

(6) That publications should be based upon projects; that each paper or bulletin should cover a project or a definite phase of the project; and that recourse should not be had too hastily to the printer.

THE CHAIRMAN. The discussion will be continued by Director Doten of Nevada.

S. B. DOTEN of Nevada. It is not an easy matter to discuss a paper with which one finds oneself in substantial agreement. For this reason, about all that I can do is to emphasize certain features of Dean Knight's paper.

The essential thing after all is that the project work of the station shall be based directly on real problems of the agriculture of the state in which

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it is located. A member of the Nevada staff said recently that it was all right for a station scientist to stick his head well up into the clouds of scientific research, just so long as he remains willing to stick his feet into the moist soil of a cow corral. Each project in the station then must be first and foremost an attempt to solve a living, vital problem in the agriculture of the state. If thus based, then the form that the bulletin should take will follow almost as a matter of course.

The station worker, putting his whole strength and energy into the solution of a genuine agricultural problem, is bound to secure facts of interest and value to the farming public. Such facts readily can be expressed in plain language and published in a brief and attractive form for the farmers themselves. The language will not be technical. Incidentally the necessity of stating the results of complex investigational work in concise and simple language is a valuable discipline for the scientist. And bulletins should be worded carefully and illustrated with drawings and photographs that will convey definite information to practical men.

Of course, research of a technical character may be demanded by the very nature of a farm problem, and the full publication of such research may require the preparation of a highly technical statement, intelligible only to specialists. It is useless and unwise to publish a highly technical bulletin for distribution to farmers and the editors of local papers. The station then, if its funds will allow, may publish technical bulletins for distribution to a small circle of scientific specialists and to libraries; but on the whole it may prove better to publish such technical material only in scientific journals, or in the Journal of Agricultural Research, full credit being given to the station at which the work is done and to the funds, federal or state, which made the work possible.

Of the two classes into which station bulletins naturally fall, the popular bulletins are apt to be the more difficult to prepare, simply because in presenting the results of complex investigations to men not scientifically trained, it is necessary often to print more material than exists in the actual experimental work itself. It is the pedagogical aspect of the presentation which is difficult. Enough general information must be given to make clear the bearing of the experiment, its nature, its relation to other experimental work and its relation to agriculture.

THE CHAIRMAN. A paper on "Publication by the Stations in the Journal of Agricultural Research or Scientific Journals" prepared by Dr. Raymond Pearl of Maine, will be read by Director C. D. Woods of Maine.

THE PUBLICATION OF THE RESULTS OF INVESTIGATIONS MADE IN EXPERIMENT STATIONS IN TECHNICAL SCIENTIFIC JOURNALS, INCLUDING THE JOURNAL OF AGRICULTURAL RESEARCH

BY RAYMOND PEARL

In order to gain a proper perspective for a consideration of the topic which has been assigned the final place in this discussion of experiment station publications, namely the publication of results in scientific journals, including the Journal of Agricultural Research, it will be necessary to consider very briefly certain historical aspects of the question. Until within the last few years it has been a well nigh universal practice of the experiment stations in this country to publish all, or very nearly all, of the material which they have had for publication in the form of bulletins. The reason for this prac-

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tice, which always has seemed anomalous to scientific workers in other than agricultural fields, of course is found in the historical beginnings of station work and station publication in America.

Section 1 of the Hatch Act provided "That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigations of agricultural science," experiment stations were to be established. Further on Section 4 provided "That bulletins or reports of progress shall be published" as often as once in three months, and these distributed to farmers and newspapers.

Now the idea plainly embodied in all this was that the station should issue bulletins in order that the farmers might be informed of the nature and results of its activities. This entirely laudable idea worked well enough at first. Very soon, however, as the character and quality of the station work changed and the stations began in some measure to fulfil the second purpose for which they were organized, namely to contribute to agricultural knowledge by investigation, it came about that bulletins sometimes were issued which, from the very nature of the case, left the farmer, who had the temerity to tackle reading them, on the whole rather worse informed when he had finished than he was before he began. Something of this sort was bound to be the case as soon as experiment station work was of anything but the most superficial character. Just as soon as there began to be issued in bulletin form really scientific papers, of a technical character, it became evident that the publishing activity of a station must perform two separate and distinct functions, and not merely a single one as was evidently contemplated by those who prepared the Hatch Act.

These two functions are: (1) To inform the general public of the activity of the station, with reference to such matters as it (the public) is actually interested in from the viewpoint of practical farming; in other words in the language of the original act, to diffuse among the people useful and practical information in relation to agricultural operations. (2) To promote the progress of agricultural science and stimulate further investigation by making available to workers in that branch of science complete and detailed technical accounts of what already has been done. Technical scientific publication is absolutely necessary to the advance of science. The reason why scientific men publish their results is not, as some executives sometimes appear to believe, in order that they may get better jobs, but to contribute their mite to the accumulated and classified experience of the world, which is science.

The distinction between these two reasons for publication was almost entirely lost sight of in the earlier history of the stations. One regrets to observe that even in the present enlightened era of experiment station evolution there does not appear to be universally present a clear and complete discrimination between these two different, and indeed essentially antithetic, sorts of publication. Not very long ago one of our most distinguished directors, in a praiseworthy desire to assert the equality (or even superiority) in respect of intellectual attainment of his constituency as compared with the constituencies of other stations, made a statement in a scientific journal to the broad effect that his institution never had and probably never would put out anything not easily within the comprehension of the worthy and enlightened farmers of his State. Leaving aside as not quite relevent here the fact that such a statement carries two implications, one of which I fancy its genial author overlooked in his zeal to make the other, it would seem clear

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that such a position does not do full justice to the purely scientific function of a part of any station's publications.

The general thesis which I should like to make the text of this paper is that while what has been called above the first function of station publishing activity, namely the diffusing among the people of useful knowledge, is, on the whole, very well served by the bulletin form, on the other hand the second or purely scientific function of station publishing is, on the whole, very badly served by that form. Further, the attempt will be made to show that the very best manner of serving the second function, which the whole experience of the world's scientific workers has brought forth, is by publication in established scientific journals.

As a first step towards the establishment of this thesis it is desired to quote a short extract from a highly entertaining treatise published nearly four hundred years ago. This work is "A Boke, or Counseil against the Disease Commonly Called the Sweate or Sweatyng Sicknesse made by John Cajus * * * * * * 1552." John Cajus, it will be recalled, was the man who re-established that Cambridge foundation since known as Gonville and Cajus College. He was one of the most distinguished physicians of his day, and withal an exceedingly keen, witty and shrewd person, whose great learning never upset his common sense. In his introduction to the "Sweatyng Sickness" he mentions his earliest writings, which were translations out of Latin into English. He goes on to say: "Sence yt tyme diuerse other thynges I haue written, but with entente neuer more to write in the Englishe tongue, partly because the comoditie of that which is so written, passeth not the compasse of Englande, but remaineth enclosed within the seas, and partly because I thought that labours so taken should be halfe loste among them whiche sette not by learnyng. Thirdly for that I thought it beste to auoide the judgement of the multitude, from whome in maters of learnyng a man shal be forced to dissente, in disprouyng that whiche they most approue, & approuyng that whiche they moste disalowe. Forthly for that the common settyng furthe and printyg of euery foolishe thyng in englishe, both of phisicke vnperfectly, and other matters vndiscretly, diminishe the grace of thynges learned set furth in the same. But chiefly, because I wolde geue none example or comforte to my countrie men, (who I wolde to be now, as heretofore they haue bene, comparable in learnyng to men of other countries) to stonde onely in the Englishe tongue, but to leaue the simplicite of the same, and to procede further in many and diuerse knowledges bothe in tongues and sciences at home and in vniuersities, to the adournyng of the comonwelthe, better seruice of their kyng, & great pleasure and commodite of their own selues, to what kinde of life so euer they shold aplie them. Therefore whatsoeuer sence that tyme I minded to write, I wrate ye same either in greke or latine."

In this quaint phraseology of three centuries and more ago are stated the fundamental reasons why experiment station workers of today will do well to publish the major portion of the purely scientific results of their labors —not in bulletins but in established scientific journals. Point for point the reason why learned men should publish their best technical results in the best technical manner were precisely the same in the sixteenth century as they are now in the twentieth. Let us see: The "comoditie" of the station bulletin very rarely indeed passes the compass of America, and consequently fails to gain the attention of the European workers in the same field. Secondly, the labors taken in the carrying out of a piece of investigation are indeed more than "halfe loste" if the results are published in a bulletin which chiefly comes

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to the attention of the farmer, who certainly "settes not by learnyng" in the sense that he is in no wise interested in the technicalities of science. The third point is one about which perhaps we cannot expect full agreement, but as honest differences of opinion can do no harm, let me state clearly as my own conviction, that our friend Cajus is right in his assertion that good work is harmed, and the cause for which it stands is harmed, by so publishing it as to invite the unintelligent criticism of uninformed people. This is exactly what we do whenever we publish technical scientific material in bulletins distributed to the general farming public. In spite of the somewhat rabid admonishings which were directed towards the writer when he made the same statement once before, he ventures now to reiterate that the general agricultural public is, as a class, totally incapable of forming any just opinion of the meaning or value of the technical details of scientific work. To invite them to form and express such opinion merely calls down upon the station and the author ridicule, or worse. For those, if there be any such still, whose democracy is so intense as to lead them to the conviction that there are no differences between men, and that the humblest hired man on the farm is the intellectual peer of a Newton or a Darwin, the above will sound undemocratic. Really it is not. To preserve peace in the family, but only for that reason, I am willing to admit that perhaps all of us might be Newtons had we been subjected to the same environment. My only point is that, whether because of heredity or environment, in real fact we are not all Newtons. A page of Sanskrit is, I very much regret to say, totally incomprehensible to me. There are many pages of many bulletins which have been issued by American experiment stations which are totally incomprehensible to most farmers. May we not then, without calling each other names like "codfish aristocrat", let the matter rest here, and turn to Cajus' fourth point. That point, taken over into our present "universe of discourse", is that since a great deal about agriculture that is purely practical, not scientific in any sense, and of an entirely ephemeral nature, has been and is continually published in bulletin form, it can only work to the hurt of first class research work, such as nearly every one of our stations is producing, to publish it in bibliographical community with trivial matter which composes so great a part of bulletin literature as a class. Literary and scientific productions, as well as men, are judged by the company they keep.

The fifth and the "chiefe" reason why the stations should publish more of their research work in journals rather than bulletins is because of the educational value of that method for the station men themselves. If a piece of work is submitted to a technical journal for publication, that work must pass a test of merit which is entirely independent of station politics, executive favoritism, the marital connections of the author, the probable effect on the constituency and next year's appropriation, and a host of other things which have been known to play a part in bulletin publication. The work will be judged by the editorial board of the journal strictly on its own merits as a piece of scientific research, and on no other basis. Journal publication provides each director with an opportunity to see the scientific work of his station as others see it. Scientific papers are not unlike favorite sons: it is often very difficult for the fond parent to discern in them any faults at all. Independent editorial boards, on the other hand, do that sort of thing very well.

If an independent chemical, or botanical, or zoological, or bacteriological or agricultural journal refuses to publish a paper submitted from a station, the author and the director are bound to come to the conclusion, since no

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other is possible, that in some way or other this paper does not measure up to a standard which disinterested experts in the given field of knowledge regard as the irreducible minimum below which sound scientific work cannot fall. On the other hand, if it is accepted the work receives the hallmark of standard character.

There is one objection which has been raised to the publishing of a part or the whole of a station's scientific output in different journals which should receive careful attention. This objection is that by this practice the station's work as a whole does not make the impression of large unity which it does if it is all published in one place, namely the bulletins of the station itself. A somewhat vulgar expression of this same idea, which one sometimes hears, is that journal publication makes for the aggrandizement of the author at the expense of the station. It has been a theory of station management in some quarters, though now the theory is conspicuous by its nearly complete absence, that the station as such alone should have visible existence and that the individuals composing the staff (save possibly the director) should be publicly considered as invisible, undiscoverable, nonentities, not at home. Journal publication has been considered subversive of this pleasant arrangement.

This theory seems to overlook certain facts of psychology, common sense, and ethics. It appears entirely clear that the nearer the actual conditions in a station approach to the theory that the members of its staff are individual non-entities, the smaller is bound to be its measure of glory with its constituency and its peers, quite regardless of its mode of publication. For, after all, a station is its staff *et praeterea nihil*.

As a matter of fact the mere existence of an official institution always suffices to gather to the institution as such a large part of the *kudos* which may attach to the accomplishments of its component individuals. Plenty of evidence of this, if evidence be needed, is seen in the very small influence an individual can exert except as a member of an organisation or institution. And conversely, an institution never gains fame or influence, except through the ability and the achievements of its individual members. The New Paradise Experiment Station is a great station because it has on its staff Dr. J. Doe and Professor R. Roe who are investigators of great originality and ability, and because its director is a wise and farsighted man.

To come back to the first point, it is very much to be doubted whether the scattering of the technical publications in journals in any degree detracts from the fame or influence of the station. On the contrary it is probable that both of these things are considerably increased by this mode of publication. In the first place the journals are the standard channel for bringing new results to the attention of the scientific world. They unquestionably reach a much wider audience of scientific men than do the bulletins, even under the most favorable circumstances.

So far we have spoken of scientific journals in general. Now let us turn to one in particular, which should interest every station worker in this country, the Journal of Agricultural Research. This journal became almost exactly one year ago, the official organ of this Association and of the United States Department of Agriculture jointly. Experiment station papers are received and published on precisely equal terms with department papers. One-half of the members of the editorial board are station men. In the editing of the journal the attempt is being made to set a standard as to scientific content and literary form for the papers which shall be as high as the highest maintained by independent scientific journals, whether in the field of pure or applied science. The journal is being given an extremely comprehensive

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standard library circulation throughout the world. For the first time it provides a medium of publication altogether worthy of the best American work in agricultural science.

Will the stations support the Journal of Agricultural Research by sending to it specimens of their best output? The past year's experience indicates that the Journal meets a real need and will be supported by the stations. Papers have been published or accepted for publication from the following stations: California, Montana, Utah, Minnesota, Illinois, Wisconsin, Michigan, Ohio, Tennessee, Kentucky, both New York stations, Pennsylvania (Institute of Animal Nutrition), New Jersey, North Carolina, Florida and Maine; which is not a bad showing for the first year.

Altogether it seems to the writer to be inevitable, as the experiment stations take on more and more the character of research institutions, and leave behind more and more that type of activity which was essential at the beginning but is now being taken over by extension departments that all the time an increasing proportion of the scientific output will be published in the standard established scientific journals. In this way only can it take the place which is its due in the world's scientific literature.

C. D. Woods. It may interest you to know, in connection with the consideration of Doctor Pearl's paper, that the general policy of the Maine Agricultural Experiment Station is essentially in accord with the one suggested in this paper. The station publishes its material in four different ways: viz.:

1. *In scientific journals.* The original publication of research results is made in this way in the majority of cases. Reprints from the journal to the number of 300 to 400 are purchased by the station and distributed to a selected list of specialists, including only those who reciprocate with exchanges of their own papers.

2. *Bulletins.* This form of publication is used primarily for the publication of whatever results of the station's own work appear likely to be immediately and directly useful or interesting to the serious student of practical agriculture, especially the farmer. Such material includes spraying experiments, agronomical practice, variety tests, some plant and animal breeding work, etc. While occasionally an extremely technical piece of work is published as a bulletin, such a bulletin never is distributed to the agricultural public except upon individual written request.

3. *Circulars.* These are used for two purposes. (a) Miscellaneous timely information needed by the farmer. (b) Abstracts in popular language of all bulletins except such as are themselves already extremely popular. These four to eight page circulars are distributed to the general agricultural public instead of bulletins, as was formerly done, with the result of saving a good deal of public money, and at the same time giving the public what it both wants and needs, distinctly in a more effective manner than under the old plan.

4. *Publicity letters.* These are weekly news-letters regarding the work and results of the station sent to a small and selected list of the most prominent daily papers in Maine, and one out-of-state paper.

In the annual report are included the bulletins, certain circulars the value of which is thought to be in some degree permanent, and brief abstracts of all material published in technical scientific journals.

This general policy of publication has been worked out by the director and station staff, and they are all of the opinion that it is an effective one. It operates on the rifle rather than the shot-gun principle. We aim to pub-

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lish our results in the manner and at the point where they will do the most good.

THE CHAIRMAN. The discussion will be continued by Director B. W. Kilgore of North Carolina.

B. W. KILGORE. Mr. Pearl, being a member of the editorial committee of the Journal of Agricultural Research, naturally has well covered the field as regards that journal.

There are two records, as I see it, that should be made of agricultural research work; in some scientific journal and in bulletin form. As published through the former channel they will be readily understood by and quickly got into the hands of technical workers. Whether the new journal or some more narrowly technical publication should be used, is a question. At present I believe that an article upon a strictly chemical subject would reach our working chemists most effectively if published in some chemical journal dealing with that special phase of chemistry. The other form of record, the popular way, as in a bulletin, already has been fully discussed.

No piece of station investigation meant to help agriculture is completed until it has been put in popular form so that the farmer himself can use it, and so that the investigator can see whether it has or has not practical application. Investigations which have been thought to be complete, when tried out in a practical way have been found lacking in some detail; and the worker has profited by the disclosure. In the early days we tried to place our technical bulletins in the hands of the general public. They did much more harm than good. Then they were published in the annual report. Now we publish technical work in the technical journals and republish the same material in the annual report in order to have a complete record of our work.

C. D. WOODS. In a few instances, we have republished in bulletin form, particularly where publication is made in a foreign scientific journal or one the circulation of which is limited, that is to say limited as to its American circulation. We were unable otherwise to get enough copies to satisfy our library exchanges. We have only a small exchange list for our more highly technical publications. For example, these would not be sent to the University of California library unless that institution issued a class of publications analogous to ours which they exchanged with us. With these few exceptions we have not made a practice of reprinting. In our final annual summary bulletin we print an abstract of each scientific paper published during the year prepared by its author, covering usually not more than thirty or forty lines.

J. G. LIPMAN of New Jersey. Station workers are feeling more and more that the technical station bulletin does not suffice. Most of us are agreed that research journals offer an excellent channel for the publication of station literature. Yet at the same time we feel increasingly that such research journals as are now available do not meet our needs, as judged by the experience of scientific workers both in Europe and America. Specialization is increasing in every subject. For instance, you will recall that the American Chemical Society has established several journals and the publications in these journals are segregated. This procedure is not unique. The European chemical journals tend to group their articles. Articles of a certain type are contributed to one chemical journal and of a different type to another journal. I question whether the Journal of Agricultural Research always will be adequate and feel that we may expect to see increasing specialization.

The length of an article has a bearing on its usefulness. Some of the European journals accept long articles, possibly two hundred pages in length. I doubt if so long an article, even though scientifically sound, would be accepted

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by the Journal of Agricultural Research. An article should not be discriminated against merely because it is long, provided it has scientific value. Its editors state that reviews will be accepted only within certain limitations. Good reviews are worth while. I hope that the editors will be liberal in this respect, because reviews at stated intervals serve admirably to keep us in touch with progress.

As the volume of material for publication accumulates, I seriously question our ability to avoid either the establishment of new journals, as has been found necessary in this country and abroad, or the sub-division of the Journal of Agricultural Research, each part to be devoted to a specialty.

C. F. CURTISS of Iowa. I think we can agree with Doctor Pearl in his statement concerning the desirability of the publication of technical material in the research journals. Yet, if I understood him correctly, this paper seemed to carry the inference that this should be the exclusive channel of publication. I am not sure that I can agree with this position.

Several stations for some time have been issuing popular and technical editions. When an investigation is of such a nature that after it has been carried to a satisfactory conclusion the results cannot be given to the public in an intelligible way in a single bulletin, to serve both laymen and scientists alike, two publications are issued, a popular edition and a technical edition. The latter has a limited circulation and is not intended for the general reader; but it is made known in both publications that it is available to all who ask for it. I think it is very desirable that the results of all station work should be available through the station publications. I question whether those in charge of the research journals should be the sole judges of the usefulness and value of a piece of scientific work, as to its fitness for publication. That would be the situation if there were no other judges and if the stations were to discontinue the policy of publishing the results of their own technical work. The publications of each station should furnish a complete record of its research activities.

Reference was made early in the discussion to the desirability of a high standard of literary finish. Doubtless this is desirable; yet I believe that it is possible to over-emphasize literary form in presenting the results of station investigations, and that striving for literary finish and excellence is not always conducive to accuracy of statement. The results should be clearly and intelligibly presented without too much effort at literary form. The stations often are critised by the agricultural press because their bulletins are not readable, not always because they are too technical, but because they are not "live matter", because they are not presented in newspaper literary form, so to speak. I do not accept that point of view. The stations should publish facts, publish them directly, concisely, accurately, in such a way that anyone who is interested can determine those facts; and when they are re-written, the agricultural papers and others can use their own form.

C. D. WOODS. If directness, conciseness and accuracy do not constitute literary form, I do not know what literary form is.

E. D. BALL of Utah. If a station publishes the results of good technical investigation, they should be placed so that they will secure the widest possible circulation among scientific men. Yet many stations bury such matter in the annual report which nobody reads.

R. W. THATCHER of Minnesota. The audience rather than the author should be considered in a preparation of experiment station bulletins. We are dealing with a class of publications prepared and distributed at public expense. That fact at once puts them in a different class than the literary endeavor

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which is prepared by an author in order to exhibit his best ability which he may sell for the instruction of his audience. Many of our difficulties with reference to the preparation and distribution of station publications would be avoided if we always considered the audience of readers. Whether the material should be put in popular or in technical form should be determined by the preference of the audience.

At Minnesota we have adopted for those articles which are submitted to the editors of the Journal of Agricultural Research and other scientific journals, a system like that obtaining with station bulletins. Every article which is published anywhere giving the results of experiment station research must be approved by the director and a record of such approval filed. At least three copies of separates of all such publications are filed in the office of the station staff secretary and become a part of the permanent record. An abstract of each article is made for each annual report.

THE CHAIRMAN. The first speaker suggested that a general discussion of the agricultural conditions and problems of the State, which, in the view of the director, were before the station, should be included in the annual report. Has it been customary, is it thought wise to make a review of the agricultural situation or of the agricultural problems of a state a part of the annual report?

R. H. FORBES. I intended to convey the meaning that a survey, a simple digest of conditions in the agricultural field in which we must work in close relation should be made, in order that we might choose projects intelligently.

B. I. WHEELER. My opinion would be diametrically opposed to what Director Forbes advocates. The annual report should display nothing but the activities of the experiment station, a general discussion of those problems with which it is busying itself. I should decry bringing in any outside material or making a general agricultural survey of the state or anything of that kind. No station covers the entire broad field of agriculture in its state.

R. H. FORBES. Agricultural conditions are changing so rapidly in some states that, unless from time to time we review our field, we will soon find that we are getting out of relation to it. The very first thing necessary in outlining and maintaining a program of experimental work is to understand the field in relation to which that experimental work is planned.

C. D. WOODS. The Maine Federation of Agricultural Organizations devotes a two-day session to the review of Maine's agricultural problems.

Our annual station report, which is issued in limited editions and is sent to station directors and to libraries on our exchange list, summarizes the work of the various departments. Formerly the Commissioner of Agriculture used to reprint in his annual report the full station report, which led to duplication. We now bind together the bulletins for the year in the annual report and write from 100 to 150 pages which goes to the director's desk. He tries to shape it for publication. This is issued as a special report, not printed by the station but by the State Department of Agriculture. This together with the reports of our regulatory or inspection work appears in our annual report as a supplement.

We list technical articles whether printed by the station or in technical journals, giving the number of pages and the usual complete library information. No results of station investigations can be given out by any member of the staff unless by consent of the director's office. No chemical analysis can be issued without such consent, lest information be furnished which may get us into trouble.

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Those things which are of temporary value are bound separately as a supplement and attached to the annual report which contains those things which are of permanent value. Pagination is distinct.

W. P. BROOKS of Massachusetts. Anyone who desires to have a complete idea of the activities of a station would prefer to have publications of permanent value kept separate from those of temporary value. For that reason, in Massachusetts we do not include the control bulletins in the regular series.

It takes much room to hold the literature which is being put out in these days. I try to keep in a fire-proof vault as complete a file of all station and all federal department publications as I have been able to gather and they are taking up much room.

E. W. ALLEN of Washington, D. C. We are making much progress in the direction of relating our publications more directly to the audience we intend to reach. As our work has become more technical in character it has seemed desirable to publish it in permanent form, not always completely or fully, but with sufficient fullness so that it can be followed readily by the workers in related or other lines. Much of it has practical interest, particularly after it has been prosecuted for a considerable time. The presumption is that it will lead to something of general interest. Hence the issuance of a popular publication dealing with the results of the work is quite as important as the issuance of a technical bulletin or of an article in a technical journal giving the more complete scientific results. I am glad to note the tendency in the direction of publishing the more strictly technical articles in technical bulletins or in technical journals of various kinds, in order that they may reach the people more vitally interested in them and not be misunderstood as are many bulletins of technical nature issued in the regular series.

There is danger of losing track of the contributions published in technical journals, or of failure to connect them definitely with the stations. Usually such articles make reference to the stations whence they originate, but this is not always the case. Occasionally we note articles in technical journals dealing with experiment station work but bearing no mention of the station, unless possibly by a reference to the author's position. Such papers should retain their character of station contributions and should be plainly listed as such in the journal where they are published. Furthermore, the station should keep some track of such papers. I often have made inquiry as to whether copies of its technical papers were being gathered by the station and placed in its library, and learned sometimes that this was not being done. It may be difficult now to gather such a set of the station's own publications because of the lapse of time. In the Department we have similarly sinned in the past. Copies of papers published outside have not always been filed in the department library. At present, however, a prospective author must not only obtain permission to publish outside of departmental channels, but he must see to it that copies of the separates are filed with the department librarian.

The plan which many stations have inaugurated of listing these technical publications in the annual reports, together with brief synopses, is an excellent one. A given paper is afterwards more easily found if reference is thus made to it. Often one can remember the station from which it came or its author's name, but not the particular journal in which it was printed. Furthermore, if definite reference is made in a paper to the experiment station from which it eminated, we can easily credit the institution in abstracting it for the Experiment Station Record. Thus these technical papers are credited in our

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indexes to the institutions and may be located more easily than if they are only indexed by the author's name.

B. W. KILGORE. Is it or is it not advisable and practicable to republish in their entirety as a part of the annual report the technical articles appearing in the technical journals or elsewhere? The general practice in most stations seems to be to issue a layman's edition of the annual report. We issue a thousand copies. We bind bulletins of the year in the annual report and try to reprint the scientific articles of the year. In most cases nowadays these scientific articles could be reprinted in their entirety, the annual report thus containing all of the station work for the year. Such a procedure would have special value in later years when new workers are in charge. They might take the notion to enter upon the same problems that already have been worked over. If these articles are not a part of the station literature or easily accessible, the work might be done over again. Furthermore, some of the journals that formerly have published technical matter are not issued now and many of the important articles that were published in the earlier days now are unavailable. If such a system as I am advocating is adopted, the station record is complete. Of course it may not be practical to reprint very voluminous articles.

R. J. H. DELOACH of Georgia. We have few calls for the annual report. It is read by very few people, other than the Secretary of the Treasury, the Secretary of Agriculture, legislative committees, etc. Hence in the few reports that I have written I have tried to make it very clear what we are trying to do with the money we use. I doubt seriously if anybody reads the long and ponderous station reports. If they were condensed to a few pages, telling in a brief way what the station is trying to do, they would be more forceful and effective. Will Doctor Allen state the real purpose of a station report? For what audience is it especially intended? Is it meant for the people or for special audiences?

E. W. ALLEN. I suppose that that Congress in providing for the publication of an annual report felt that much money was being given for the conduct of a large enterprise upon which it might be desirable to have a yearly accounting. Its extent or character was not predetermined by federal enactment, except that it must include statements of receipts and expenditures. The annual reports have been growing smaller and briefer, but many of them are serving the purpose of informing the general public as to what the stations are doing, the general progress and the lines of their work and of acquainting the legislatures with the need of appropriations.

THE CHAIRMAN. Would you include reprinted bulletins?

E. W. ALLEN. I have wondered often of what advantage it was to reprint bulletins or to save a sufficient number in order to bind them into the annual report. Most libraries keep sets of the bulletins through the year in order to have a complete file for binding and if the annual report embodies the bulletins there is either duplication in binding the publications for the year or the report proper must be torn out. For the purposes of the general public it seems preferable to issue the annual report as a document by itself, with a synopsis or at least a list of the publications and the technical papers issued during the year.

C. D. WOODS. When the Hatch Act was passed experiment stations were issuing few bulletins of any kind. Station activities were set forth mainly in annual reports. The farmers of the Hatch Act doubtless had in mind the publication of an annual report similar to that now issued in Connecticut and New Jersey.

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J. W. WILSON of South Dakota. Should the report be distributed at the time when the people are busy or held until a more propitious season?

C. D. WOODS. Publications intended for popular use should be issued at the time when they are most useful. It would be absurd for us to distribute a bulletin on apple spraying in August. If it is to have any effect, it should be in the hands of the farmers in the early springtime.

F. B. MUMFORD of Missouri. It is difficult to combine in one report all the valuable suggestions that have been made. All directors' reports will not and should not be alike, as the purposes of reports in the various states may be different. In my opinion the report should not be written solely for the eyes of other directors or administrative officers, but it should be written with the public, and in particular the farmers, in mind.

If this view is correct, larger emphasis should be placed on the results of station work and less emphasis on the purely business routine. The experiment station should be ready at any time to answer the question, "What has the station accomplished for the State"? In attempting to answer this question the administrative officers may find that some of the activities of the station are of very limited value and could wisely be discontinued. A complete record of the station's activities should include any important additions or improvements made during the year, changes in the station staff, list of publications for the year, a brief digest of each bulletin, a complete list of the investigative projects upon which active work is being done, projects completed, new projects to be begun and statement of the important results achieved by the station. The report will not be complete if it fails to mention all cooperative work with other agencies, including the United States Department of Agriculture, state boards of agriculture, schools and colleges and farmers. To make such a report it is necessary that every member of the station staff should report annually upon every project. Such reports are very valuable to the investigator as well as the administrative officers.

May I make one statement in reference to the paper which was submitted by Doctor Pearl in reference to the publication of scientific results in technical journals? We are all in substantial agreement with his thesis; yet if I am correct we are to draw the inference from his paper that we should not publish the results of our research in our station publications. If that is his contention, certainly I am not in accord with it. No scientific institution with which I am familiar would undertake to publish all its activities in scientific journals. It must have its own means of publication. The tendency among institutions engaged in research is more and more to provide their own means of publication. Several stations are publishing research series. Now in Dr. Pearl's paper it is assumed that our publications are distributed widely among the farmers. Many stations have classified their mailing lists and send research bulletins only to investigators. They are not even listed in many cases. We ought increasingly to utilize the scientific journals, and particularly the Journal of Agricultural Research; yet it is manifestly a physical impossibility, if the stations are accomplishing their true function and mission, for that journal to publish all results of scientific research from the stations. The stations must and do provide their own series of scientific bulletins.

I. D. CARDIFF of Washington. The credit or prestige that should attach to a station on account of its publications is worth something. A paper published in the Journal of Agricultural Research should be so indexed that the credit will be given to the station whence it originated. If, for example, we issue the results of station work in the publications of the Carnegie Institution, the Carnegie Institution gains the prestige and not the experiment

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station. What would be the response if the United States Department of Agriculture were asked to publish with the Carnegie Institution? Director Mumford is quite correct when he states that to a large extent we must publish our own material.

THE CHAIRMAN. How large an edition of research bulletins should be published? Should a station send its research bulletins to the entire Office of Experiment Stations mailing list?

E. W. ALLEN. That would depend on circumstances, upon the subject of the bulletin, upon the amount of interest it would be likely to elicit. A few copies might answer the case in some instances, in others large editions would be necessary.

THE CHAIRMAN. The complete Office of Experiment Stations mailing list contains about 2500 names. An increase of 2500 copies would be of some technical bulletins a serious matter in some cases.

Occasionally we have reprinted as bulletins, articles which have appeared in the scientific papers, giving them a research number and stating that they were reprints. We thus preserved these publications as a part of our scientific output. We have not been able to reduce our technical bulletin editions to a point less than 4000; and if we are to send them to any large proportion of the Washington list even such an edition would hardly avail.

J. A. HILL of Wyoming. I trust that the distribution of technical bulletins will not be too closely restricted. Some of us are located in stations with small library facilities. We cannot subscribe to all the technical journals. Often it is difficult for us to secure a piece of literature that has been published in a technical journal. I wish that every station technical bulletin could be mailed to the entire staff of every other station. Copies that are not wanted could be returned under the frank. In some such way some of us could accumulate a considerable technical library and gain a little broader knowledge than that pertaining to the small field in which we operate. Frequently I find in the library a bulletin in which I am much interested which I have never received. When considering your public audience, do not overlook the people who are interested in the station work from a professional standpoint.

E. D. BALL. Should the annual report bear the authorship of the director or should the separate sections be written by and accredited to the workers in charge of the different departments?

W. R. DODSON. A new situation has arisen owing to the development of work that formerly was not fully inaugurated. The publication of extension bulletins and of the Journal of Agricultural Research alters the stations' responsibilities. This really was what led the committee to propose this topic for discussion. I fear that unless we take action, little good may result from this discussion. I would like to know whether the Association cares to recommend a definite policy as to the character of station reports and touching station literature in general. Hence I offer this resolution:

Resolved, that the committee on station organization and policy be asked to consider the advisability of recommending to this Association some definite policy touching station publications that may tend to bring about greater uniformity.

On motion, the resolution was adopted.

THE CHAIRMAN. It was suggested a year ago that the reports of standing committees of the different sections might well be presented, discussed and possibly amended before being reported to the general session. Heretofore standing committee reports have been made directly to the general session. I understand that the Executive Committee has recommended this change in

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our procedure. Does this section as a section wish to hear the report of the committee on station organization and policy at this time, or to listen to it in general session?

J. L. HILLS of Vermont. This report is scheduled for presentation at the general session tomorrow morning. Its consideration by the Association in general session could hardly be postponed until Friday morning as the program for that morning is congested. Hence if the committee report is to be read before this section, it should be read at this session.

On motion, the section went on record as favoring the proposed procedure touching the submission of the report of the standing committee on station organization and policy to the section prior to its presentation to the general session.

On motion, a recess was taken until 2 P. M., Thursday, August 12

AFTERNOON SESSION, THURSDAY, AUGUST 12, 1915

The session was called to order at 2 P. M. by the Chairman.

THE CHAIRMAN. The first address on the program deals with "Effective Correlation of Station and Extension Workers", viewed from the standpoint of the extension director. Bradford Knapp, Specialist in charge of the Farmers' Cooperative Demonstration Work in the South, will lead the discussion.

BRADFORD KNAPP of Washington, D. C. The problem of correlating the three lines of work of teaching, research and extension, and of properly administering the whole, belongs to the administration of the college, and is certainly a difficult problem. In the first place, station workers should be taught to appreciate the fact that it takes one type of men to do extension work, and another to do station work. As extension work grows and station workers recognize its function and usefulness, they will come to have a broader view regarding the relation which ought to exist. Obviously it is important in correlating the work of the two agencies that those engaged in each line should have the very highest respect and appreciation for the work and ability of those who are engaged in the other type of work. The extension worker might be likened to the soldier on the firing line. He is effective so long as munitions are supplied, but if these fail his efforts are fruitless. The stations are the munition makers. The extension workers, who use these munitions, need to appreciate the station and understand its problems, to recognize the source whence their information comes. It is equally important that the station, or the munition maker, should understand the kind of ammunition needed by the men on the firing line.

As an extension worker, I wish to present a few suggestions:

My first suggestion, familiar to you all, is that workers in similar lines in the three divisions should be associated in subject-matter departments within the institution. This association of extension workers, station workers and teaching force in subject-matter departments in the institution is growing in favor and is an excellent method of correlating the work of the three divisions.

My second suggestion grows out of the fact that eventually there will be many extension workers in the field, in close contact with the farmers. Obviously if they are of the right sort they will encounter many problems. We should foster reciprocity between the two types of workers, so that the problems can be brought to the station from the field, as well as information to be taken from the station to the field.

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My third suggestion is that extension men should be trained to popularise the station. The stations necessarily have to do much of their work at a distance from and not in direct contact with farmers. Farmers are more apt to get in personal touch with the extension service than with the station. If the administration is tactful, the extension workers can be led to popularise the station, and give it credit for having wrought out certain problems for the farmers, thus leading them more fully to appreciate this work. I have sometimes felt there is a tendency on the part of many extension workers to fail in this respect.

My fourth suggestion is that it is important, also, that station men should not be confined strictly to the station itself, but should have an opportunity to travel and mingle with farmers, lest they lose their close touch and contact with the farmer out on the farm and fail to understand the farmer's point of view and his problems.

My fifth suggestion is to trade work at times. It would help both the station and the extension forces if such an adjustment could be made between the station and extension directors. It would help effectively to correlate station and extension work for a resourceful station man, who has worked out some important problem, to go into the field and help the extension man to get it started, through demonstration work.

Finally, I believe in conferences—joint conferences of station and extension people. Some of the southern colleges bring in the county agents and all of the state extension forces to the college for one or two weeks' solid work and conference each year. During that time a special effort is made to bring the extension workers in close contact with station workers and to explain to them what ever work the station is doing. There should be both regular or periodical conferences, and occasional or more or less irregular conferences, between the two types of workers. These should be brought about by their intimate association; and there should certainly be general semi-annual or annual conferences.

After all, when we get right down to it, everything hinges on personality. If the workers have the right personality, if they desire to work together, if they have sufficient breadth of mind and they can get the right point of view, administrative problems are banished. Judicious administration and right personality are the two prime factors."

THE CHAIRMAN. "The Effective Correlation of Station and Extension Workers from the Standpoint of Station Work" will be presented by Director C. E. Thorne of Ohio.

C. E. THORNE of Ohio. We will all agree that the experiment stations taken collectively must be regarded as the source of exact knowledge with reference to those factors which bear upon the progress of agriculture. They were organized 30 years ago because it was felt that our knowledge was not sufficiently exact and definite, and that it was necessary to provide for the pursuit of additional information. I believe that it is the best means we have now of reaching further into the unknown and properly classifying and coordinating that which is known. If this idea is correct, then it becomes necessary for the teacher, whether he be teaching within college walls or in the great outside, to keep himself posted concerning the progress of the work of the experiment stations. Extension workers cannot afford to lose touch with the stations and their work. We should think of the experiment station as a collective organization. Of course an extension worker must look to his own station for much help that the stations of other states cannot give him. But many of our states are large, the diversity of their agricultural interests is great and,

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practically speaking, no station adequately can cover all the agricultural industries of its own state. It can cover only a part of the great field of work. Hence the extension worker may find it necessary to look outside his own state for help. It may be that the work done by a station in some other state may be more definitely applicable to his local conditions than that accomplished by the station in his own state, for our work does overlap in this way. Of course from the very nature of things some other station is developing some of the questions pertinent to the needs of our own state to better advantage than we can do it ourselves. However, this fact does not absolve the extension worker from the duty of keeping in the closest possible touch with his own station.

We find that our Ohio station cannot adequately serve the state's agricultural interests from any one locality. Hence we are extending the work of the station as far and as fast as possible over the State. We are establishing our work wherever the opportunity offers for doing so; establishing it on a permanent foundation, for in Ohio we have not looked upon temporary work as valuable work for the experiment station.

We feel that the county agricultural agent must have in his own county the local help which a local experiment farm can give him before he can become thoroughly efficient in his work. For this reason we are endeavoring, as far as we can control matters, to limit the appointment of county agents to those counties which have established experiment farms, and to encourage the establishment of such farms wherever it is desired that county agents be appointed. We are meeting with some success, although we find that many counties want to secure a county agent but are not willing to establish a county experiment farm. And, of course, we realize that the county experiment farm for a time cannot be of any very great assistance to the county agent; but already we have evidence that is very conclusive to us that it will be found necessary to the success of this work for the county agricultural agent to have at his command certain facilities for the study of local problems which his state station in its central locality cannot afford him.

The county agent, of course, is under the direction of the state college of agriculture, with which in Ohio the station has no organic connection. However, despite this complication, we believe that it is possible to establish a dual responsibility; that our county agents may act as the superintendents of county experiment farms without detracting from their energy or ability to conduct their work as county agents. Indeed we believe that they may strengthen their work as a result. The college and the station have clasped hands on this proposition. We are furnishing our county agents with farms wherever it is possible to do so, the clear understanding between the college of agriculture and the experiment station being that the educational work shall belong to the college of agriculture and the research work to the experiment station, and that the same individuals shall be responsible to the two institutions for the two lines of work.

As the last speaker has well said, after all it is largely a matter of personality. Everything depends upon the personnel engaged in the work. No work which the colleges ever have undertaken depends so entirely upon the element of personality as does extension work. We cannot be too careful in our selection of extension men. In matters of detail we are trying to follow many of the lines suggested by the last speaker. We hold conferences sometimes at the college of agriculture and sometimes at the experiment station. We call the county agents and members of the college staff to the experiment station for summer meetings when its work is most in evidence. Our hope is

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that all of us may have the wisdom to forget self, to see only the tremendous work that is before us, and to try as best we can to adapt ourselves to it.

THE CHAIRMAN. "The Best Means of Securing Proper Recognition and Credit for Station Work in Extension Work" will be presented by Director H. L. Russell of Wisconsin.

H. L. RUSSELL of Wisconsin. The subject set down for discussion here is one to which I must admit that I cannot contribute anything, for I do not quite understand what the program committee had in mind. If the question relates to those institutions in which there is more or less of a differentiation of the station staff from the extension staff, I cannot quite see that there can be a close correlation under those conditions. If, on the other hand, it relates to those institutions in which a department stands as a unit, wherein teaching and research and extension are included, there is much better possibility of correlation.

We must draw the line of demarcation between extension and station work more sharply than heretofore. Many of us have been doing extension work for many years, only it was not so labeled. We are now called upon to differentiate and to determine what is meant by the one or the other. This is not always easy, for there is a border between these two lines of work which is rather hard to see.

I believe in an organization in which all three lines keep abreast. Teaching, research and extension should develop in their proper relations with reference to each subject alone. That does not mean that every department in the institution will be equally developed with reference to these three lines, but it does mean that for the institution as a whole the development in any one line should be fully as strong as in the others.

A research problem has been attacked and results have been secured. It is necessary to translate these scientific results to the farmers. Whether this shall be done by the station worker or whether it passes through the extension man, is a matter which will be determined by the exigencies of each particular position.

It is essential that field demonstration work be done. Too much of our research work has drawn aloof from the practical problems of the farmer, and has not been applied in a manner that will enable him to make use of the results. We must recognize that while we derive much of our resources from federal sources, yet most of the states are contributing rather largely to the conduct of station work. If we are to return to our people adequate recognition of the response which they have made to our requests for station funds, then we must give them something worth while. The demonstrative features of our research results should be carried as far as we can. I doubt if these two lines of work often can be carried out effectively by a single individual. Many believe in the separate station staff, and a more or less separate extension staff. Personally, I hold with Mr. Knapp that it is well to permit a man to work in the two lines, and that is more helpful to him than if his entire time is given to one line of work. I want our teachers to do some research work, and our extension men to do some work other than extension. If one's activity is directed only in one direction he loses to some extent. Of course this can be carried to such an extent as to be an absurdity; indeed, such is quite apt to be the case. But where our departments are on a homogeneous foundation, where these men are in close physical contact with each other, where the extension worker is officed in the same building and in the same room or laboratory with the research man, those two will react upon each other to their mutual benefit. The research man constantly is receiving an influx of ideas brought in by the

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field man, and is all the better if occasionally he goes out into the field. Just how this will be brought about will depend in large measure upon the particular problem involved and the local conditions. Frequently financial conditions must be taken into consideration.

We must recognize, however, that because of the very rapid expansion of extension activities an added obligation is laid upon us as station workers to maintain the station enterprise at par. The colleges are more endangered today than ever before, because of the large sums of money entrusted to them wherewith to do the specific line of work involved in extension. Unless station workers conscientiously direct their efforts toward keeping up the morale of their station investigations, we shall hear from the public, and it will be increasingly difficult for us to secure appropriations for purely research work.

C. D. Woods. How do you arrange for the physical contact of men in the same department, when county agents are working at long distances from each other?

H. L. Russell. Many of our colleges have resident extension specialists who are in the field only four or five days each week. The county agents attend annual or semi-annual conferences. Our farmers, our extension men, and our department specialists hold a week's conference in November. This makes a practical though very limited point of contact. The county representatives constantly are checked up in regard to their methods and asked to bring their problems which they cannot directly answer to the station men. Necessarily that has to be done by correspondence. To my mind in a certain sense there is an absurdity in the caption, "Proper Recognition and Credit for Station Work in Extension Work." You cannot give credit for station work in extension work. Extension work is purely demonstrative work. It is a different type from that which can be classified as research work. Yet as a matter of fact we have been doing much station work which is nothing but demonstration work.

H. Hayward of Delaware. I fear that research will be relegated to the rear in our smaller states where means are limited and many of our men must serve three masters. When they have much teaching to do and are called upon for much extension work, research suffers. I am almost ready to say that I wish our station force was free from all outside obligations. More and better work would be done with less effort. The danger is a grave one.

B. W. Kilgore. The extension worker needs closer contact with the station worker than with the college worker, for he must look to his station colleague for his ammunition, for the material with which to demonstrate. All three can be so tied up that they work together thoroughly well. The program committee's thought in wording this subject now under discussion was this: How can the extension worker while in the field and in contact with the public best represent the station and its work? How he can best set forth its claims for recognition and credit? How he can best give the station its due? Unlike the extension service the experiment station is an organization which is not represented in the field, and is not as a rule in close contact with the people. It is a question whether the extension worker when he goes out into the field always actually, accurately, and indeed fairly, represents the station worker, who has not the opportunity to come in contact with the people. It means the establishment of an esprit de corps in their institution.

I am thoroughly in accord with the feeling that from the standpoint of getting state aid the station is in a critical stage. We obtained an appropriation for extension work from our legislature almost without asking for it;

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but we could not get a dollar for the station. That is partly due to the fact that the station worker is not at work in the field where the people may know about him; yet the extension man is really putting into practice and carrying to the public the results which the station has wrought out during many years.

Now the crux of the matter is just this: Will extension workers when they go in the field give proper credit to the station? I believe that this is an extremely important matter. I feel that, perhaps to a very limited extent, the field service of extension workers ought to be alternated with that of station workers, so as fairly to represent the station, and, later, lead to the necessary legislative support.

Furthermore, the station worker through the activities of the extension worker has an opportunity to try out his findings, to develop and round out his researches. Problems worked out in the laboratory or on a certain piece of land may be solved so far as laboratory or local conditions are concerned, but may not stay solved when applied elsewhere.

North Carolina has 75 county agents. They gather yearly at the college for a week's conference; and we have smaller conferences of these men with the extension specialists who have headquarters at the college. These specialists should have offices with the station and college men, working in the same department. This will tend to insure to the station proper credit for its labors, through demonstration or field extension work. More than this, it makes it impossible for conflict to arise as between what is determined by the station and what is demonstrated in extension, preventing the lamentable situation wherein an extension representative in making field demonstrations teaches one thing, and the station worker in his bulletin teaches another. If the extension specialists are made responsible for subject matter, and this subject matter is approved by departmental heads before it is made the subject of demonstration, conflicts are avoided.

R. L. Watts of Pennsylvania. I do not fear that the stations will fail to get credit for good work done. The great danger is that our work will not receive adequate financial support. The Russian army is in retreat for lack of munitions. Our army of extension men will fail in their work unless the stations manufacture munitions. The Pennsylvania legislature does not fully recognize the importance of financially supporting the station; and doubtless this situation is not local but nation wide.

Would it be feasible, desirable, or possible, to secure a federal enactment in behalf of the stations predicated on state acceptance and support, somewhat along the lines of the Smith-Lever Act? State legislatures are more apt to vote dollar for dollar than to make outright appropriations.

W. R. Dodson of Louisiana. The function of the extension worker is primarily to carry to the farmer the practical phases of scientific investigation. The effectiveness of his work is measured largely by two things, first the confidence that the practitioner has in the man that brings the message and second, the reputation and standing of the author. The relations of the investigator and the extension worker have an important influence on the work of each. The extension worker must be associated with the investigator sufficiently to catch his spirit of devotion, and to learn his sincerity and trustworthiness, before he can give out most effectively the practical results of these investigations. On the other hand, I believe no one can be of greater service to the investigator than can the extension worker, in presenting the combined observations and views of the most observant farmers, which is often a very potent factor in advancing scientific investigation. If two men

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are thus intimately associated in their work, the question of credit will be easily solved.

My judgment is that the extension workers should spend a period from time to time with the research men, and the research man should from time to time spend a period with the extension workers. Let each see the other at work, learn what he is doing and how it is done, discuss points of mutual interest and the question of how each can become more efficient; this will foster their personal friendship, and both will be stimulated to do more and better work, and at the same time give the other credit for his full share of the work.

F. B. LINFIELD of Montana. We have two groups of extension workers, the county agriculturist and the state specialist. The former's problems are the more difficult, for he has to deal with individual farmers, many of whom are in a measure specialists. It is important that he know his limitations and refer many of the special problems to the state specialists. In his relation to the farmer he represents all departments of the college, whereas each specialist represents only a single department. Whenever these men are drawn from institutions in other states there is danger that their point of view may not coincide with that of the home-grown specialist; and of course if effective work is to be done essential unity must be preserved in the agricultural teaching in all departments.

The college and station specialists should be the final authorities in most cases, should form a part of the departmental organization and be in intimate touch with all sources of available information. Extension specialists may be effectively kept up to date and inconsistencies in teaching be minimized if they are required to prepare all circulars of information, submitting them for approval to the college and station specialists.

I. D. CARDIFF. The people usually want to see and hear the man who has done the work. A substitute will not serve. To some extent this demand must be recognized, even though the investigator's place is really in his laboratory or among his plats. How is this demand met in other states?

What is the result of continued extension work upon the extension worker himself? It has been my observation that after a time his argument becomes somewhat attenuated, particularly if he does not often come into contact with the original source of information. He flattens out. This is a serious matter both for the man and the institution. This problem has been solved occasionally by transferring a worker for a year from extension to research and vice versa. I would like to know how others have dealt with the situation.

The continuity of station work is unquestionably in danger. We have become much interested of late for obvious reasons in extension work, and perhaps have neglected other lines. Furthermore the Secretary of Agriculture is said to have stated that the results of investigational work now in hand will supply the needs of extension workers for fifty years to come. The statement has been quoted widely and we are confronted with it when we approach legislative committees requesting appropriations for station work. The situation is yet further aggravated when it is made to appear to the public mind that the stations really are doing but little investigational work, since the results of their efforts are constantly being used by the Federal Department of Agriculture in forms which are much more widely copied by the press than are our station publications. The problem merits our gravest consideration.

J. G. LIPMAN. After our extension work was well under way we quickly came to realize the danger, that the extension men may stagnate. It is our

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custom to require extension specialists to be in the office at least two days a week. The research and extension men in kindred lines occupy so far as possible the same rooms, thus keeping in touch. For the good of the work, no matter how great the pressure from the outside, extension men should be kept in the office at least two days a week, and be compelled to read and to study, to find out what is going on, so that they may grow just as research men grow. The county agents call on these extension specialists freely, just as they do upon the research men, and unless they have read and studied they are of but secondary value to the agents.

THE CHAIRMAN. The last subject for discussion is "What Can the Stations do to Encourage More Men to Fit Themselves for Advanced Research?" This question will be discussed by Director C. D. Woods of Maine.

C. D. WOODS. I know of nothing that is troubling station administrators so much at present as is the question how to get competent young men to enter upon and to grow up in experiment station work and to become investigators Practically every student who enters college leaves it as he enters, an opportunist. He takes the position that comes to him. And with this large demand for men to enter upon extension work and county agency work, at salaries larger than we have ever thought of paying to men with only four years of instruction to their credit, how we are to obtain the right type of men to enter the field of investigation? After a man has done enough research work so that he knows that he loves it he will keep on with it, unless there comes to him the temptation to give up research work and take on other things because of their wider interests and on account of the larger salary; and then I do not know how he can be held.

We have tried up in the Northeast to get young men to come to us and to help them become investigators. We have taken young men as associates, who have had four years' college training. We strive to make their stay profitable to both parties concerned. Often after two or three years we find we can hold a man no longer after we have made him better than he was when he came to us. We take our own men largely, but insist that those who come to us shall take post-graduate work in the university. We give them the time in station hours to do this work, but nothing else. The college gives no credit for overtime. It takes a man from two to three years to secure the master's degree.

We arrange so that our station workers may handle post-graduate students from other departments. We assign some of our problems to them. These station men become in a sense instructors. The work we get from these post-graduates more than compensates for the loss of time to the station men. However, the university is as desirous of getting credit as the station workers are of getting their correct credit from the extension men, and harmony does not always prevail.

It is not possible under ordinary circumstances for a man to do his work in absentia. If we could persuade the management of our universities to permit such work it would enable us to get more advanced work for our station men.

On two occasions we have sent men to Wisconsin for a year to complete their studies for the doctorate. We continued their salaries, gave them station problems to solve and made contracts in advance stipulating that they should remain with us for a certain number of years after return without increase in salary. The scheme has worked well.

H. L. RUSSELL. It is possible for us to exert a very profound influence upon the young men that come to our institution toward directing them into

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this line of work, provided they manifest any taste for it. One of the very best things we have is what we call the senior thesis on research work. When I was doing departmental work I spent much time helping senior students. They worked frequently upon our problems. In that way I was able to start several young fellows in research work. If any of our seniors have real research ability it is disclosed by the character of their senior thesis. They become fired with the enthusiasm which comes only to the man whose lips have been touched with the coals from the altar of science. If you can get young men started under those conditions, money frequently is no object to them. I tell them that if they have love for that kind of a proposition, they ought to consider seriously whether that is not the field of activity they should enter upon. I also tell them that the financial returns are apt to be empty, and that they must prepare to go through several years of the conservation period. If they want to start in on the conservation period, we make them assistants and give them an opportunity to continue graduate work for a master's degree at very meagre compensations. We get young graduates for from $600 to $800 a year who are our best men, men who could go out and get from $1200 to $1500 a year elsewhere.

As Director Woods has said, we choose our vocations largely as opportunists. Every one of us, if we were called upon to say why we got our present jobs, would say, not that we conscientiously chose to follow this line, but that we accepted the opportunity which came to us. It is the same with these young men. If a mature, well informed station man takes them aside and points out the opportunities there are for those who have any marked ability in that direction, we can get a considerable number of them.

We have twenty or thirty graduate men in our department of plant pathology. They came from all over the United States, because they wanted to work under the head of that department. He assigns problems to them which fit their conditions. This enables us to pay from $100 to $250 for an investigation the results of which we can use. We are thus getting for an annual expenditure of from $1200 to $1500, $10,000 worth of service. And we are training up under an inspiring teacher a group of young men who are going out all over the United States.

Concerning this exchange relationship mentioned by Director Woods, we are just now entering into a similar relation with reference to one of our men whom we are sending to the Washington laboratories. We pay his salary at the same rate as if he remained at Wisconsin. He is working on a Wisconsin problem, and he can do it in Washington just as well as he could in Wisconsin; and it makes him a better and broader man to spend some time in the Washington environment.

If we go at this proposition conscientiously as college and as station administrators, we can do a great deal ourselves in constantly bringing in men of high-grade character and working them into this line. Many men ought not to go into research work; they have no particular qualifications in that direction. If we are not bright enough to make selections from the best of the graduating class when we have these men among us, we had better resign in favor of those who can.

W. M. JARDINE of Kansas. We recognize the need of encouraging promising young men to take post-graduate work. By way of encouragement, our institution offers some eight graduate fellowships, each paying four hundred dollars for the school year, and giving an opportunity to earn additional money during the summer months. Fellows are assigned problems relating

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to station investigational work and the information thus obtained is used as the basis for their theses.

A limited number of promising junior students are selected to spend a year at our Fort Hays substation, where we have a number of lines of investigation under way in cooperation with different bureaus of the United States Department of Agriculture. These students become assistants to the men in charge of the investigations. A certain amount of college credit and reasonable financial remuneration are allowed for such service. These young men often go to Washington, where they spend the winter months in the laboratories of the Department of Agriculture, returning to the college the following year to complete their work for the baccalaureate degree. This plan has worked out very satisfactorily to all concerned and weh ope to enlarge upon it in the near future.

E. D. BALL of Utah. I have been connected with institutions that have definitely encouraged research work and with others that did not, and the difference in the number of research men turned out has been striking.

The director's most difficult problem is the selection of men interested in and capable of research. The local scientific club in which the research men take part is the best recruiting ground for future workers. Advanced students should be invited. Only a few may come, but those few are likely to prove to be research men in the making.

Dean Russell's suggestion with reference to senior theses is good. An excursion beyond the borders of the known is worth while to any man. That only comparatively few will make full use of the opportunities offered is not a valid reason why this method of selecting and encouraging the few should not be continued. At the Utah station several promising young research workers have been encouraged to obtain further training by the payment of one-half year's salary while away for a year upon research work.

The report of the nominating committee was made and, on motion, was received and adopted (see page 154).

On motion, the recommendation of the committee on experiment station organization and policy, touching the relation of the stations to police work (page 125) was specifically referred to the incoming sectional committee.

On motion, the section adjourned.

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SECTION ON EXTENSION WORK

WEDNESDAY AFTERNOON, AUGUST 11, 1915

THE CHAIRMAN. Dr. Bradford Knapp, Specialist in charge of the Farmers' Cooperative Demonstration Work in the South, will discuss "The Place Which Demonstrations Should Have in Extension Work".

BRADFORD KNAPP of Washington, D. C. There is a certain amount of confusion in our terminology, due to the fact that the work is new and we have no adequate words for conveying those fine distinctions which are expressed so ably in other languages. For example, we have no way, as we ought to have, of distinguishing between two very distinct types of demonstration. The first type is what is commonly called a demonstration or that type of illustration conducted by the teacher himself; the second is the demonstration which is conducted by the one who is being taught. There is a vital distinction between the two, not only in their uses but in their value in transmitting knowledge to others. Years ago we adopted in our work in the South the term "cooperative demonstrations" with the purpose of attempting to differentiate between these two types.

Upon examining recently the Smith-Lever fund accounts of one of our agricultural colleges, I found a bill for an advertograph machine for the purpose of illustration. On the bill were written the words "for demonstration work" or "for demonstrations". I asked the director by what process of mind he conceived that a person using such an instrument would be demonstrating. I endeavored to persuade him that he was simply illustrating and not demonstrating, but he vigorously defended his use of the term.

The Smith-Lever Act, now coming into effect in all of the states, contains certain significant language, to which I call your attention. The second section provides that "cooperative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities, and imparting to said persons information on said subjects through field demonstrations, publications and otherwise" and in the very first part of the paragraph or section it provides "that in order to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics and to encourage the application of the same, there may be inaugurated", etc., etc.

Clearly, in all the work that is to be undertaken under the Smith-Lever Act we are to disseminate "useful and practical information on subjects relating to agriculture and home economics"; and this will consist of "instruction and practical demonstrations in agriculture and home economics"; and these shall be given through "field demonstrations, publications and otherwise". I am merely quoting these words for the purpose of impressing upon your minds the fact that, without doubt, those who framed this legislation had in mind a very practical type of work.

It is going to be somewhat difficult to discuss the place which demonstrations should occupy in extension work without trespassing in some measure upon the papers which are to follow. It is almost impossible for me to discuss, as I should like to discuss, this subject without dealing also with

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the county agents and the home economic agents, the organization of their work in the counties, how they proceed to disseminate information and secure its practical adoption by the farmers of the county. I shall endeavor to avoid as much as possible trespassing upon the province of the papers which are to follow, dealing with the problem of organization.

I take it that in most of the states the organization of extension work contemplates two classes of workers, namely, the county agent and the specialist. Demonstrations should be an indispensable adjunct of the work of each of these two classes.

The county agent needs to do many different types of work. I have endeavored to analyze his work and to classify it into three divisions, the first of which is demonstration; the second, instruction; and the third, organization. These are so intermingled that it is difficult to separate them.

A demonstration, in the sense in which I am going to use the term in this discussion, is something done by the farmer or some member of his family, on his farm or in the home, at the instigation and under the instruction of the county agent or other extension worker, in which the farmer or some member of his family actually does the work and the instructor simply gives directions. The essential element of a cooperative demonstration is the fact that it is conducted by the farmer, who is the real demonstrator.

The value of such demonstrations has sometimes been overlooked. It has a direct effect upon the farmer and also has an important effect upon the county agent himself and on his work. Such a demonstration serves two purposes; first, it conveys a lesson and imparts information to the farmer who is conducting the demonstration, and to his neighbors, and, second, it demonstrates to the farmer and to the community the practical worth and the value of the information which the county agent has given him. Every successful demonstration of this character not only teaches the farmer the value of better information on agriculture, or the farm wife the value of better information on home economics, but also impresses that person with the fact that the one giving the instruction leading to this demonstration has much valuable knowledge well worth knowing.

We are apt to overlook the power and influence of multiplying examples. Some twelve or fourteen years ago the Department of Agriculture attempted throughout the Southern states to conduct what were then known as demonstration farms. Many such were conducted at the expense of the Government, using leased land for the purpose of illustrating to the farmers certain better farm practices. After these publically supported farms had been conducted several years it was apparent that the farmers around each demonstration area were not adopting the methods pursued upon such farms, notwithstanding the fact that these farms averaged practically one hundred percent better in production than the surrounding farms. General interest was not aroused and no appreciable effect observed until the system was adopted of getting the farmer to conduct the demonstration himself on his own farm, with whatever tools and equipment he had, and under his own peculiar conditions. When these demonstrations were multiplied thousands of times over an entire section, we observed the results that grow out of the emphasis of a large number of examples.

I recently received a letter from a Southern extension director commenting on the effect of a large number of demonstrations of better farm practices. He stated that until about ten years ago it was a rare thing for any farmer to plow his land in the fall, to know anything about the value of seed selection or to pursue methods of shallow and intensive cultivation. He further stated

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that now it is rather the exception to find a farmer in that region who does not know these simple things. This director was properly attributed the change to the fact that thousands upon thousands of demonstrations had been conducted by farmers under the instruction of county agents. It may be true that few farmers in that state could tell where they got the information. After the demonstrations have been multiplied sufficiently the practice begins to become general and the results come in more ways than we can possibly imagine.

Some years ago an Alabama county agent complained that people were coming to his demonstrations and going away and practicing what he was advocating without giving him credit; that they were stealing information from him. I fear he did not appreciate my answer which was to the effect that if he could not get information to them in any other way, he ought to open the door and let them come in and steal it.

The county agent who starts out with the idea that he can talk his county into a better agricultural condition or that he can change materially its farm practices simply by talking, has a hard row to hoe; but if he will start fundamentally with the idea of getting farmers to adopt the practices he advocates and carry them out through demonstrations placed at conspicuous points in the county, and if he will use these demonstrations as centers of influence, he will find the farmers' confidence in him increasing, that they have more respect for his oral instruction. He will also find them of great value as common meeting points for groups of farmers, leading to the organization of farmers' clubs and other community organizations which will be exceedingly helpful to him in his work.

We find by experience in the South, not only in counties where the agriculture is very highly developed but also in counties where its status is unsatisfactory, that one of the best ways for the county agent to get hold of the people and gain their confidence, is to show his ability through demonstrations. After that is done there opens up for him large opportunity for advisory work, giving the farmers information, answering their questions and imparting a large amount of information which he does not have opportunity to follow up by demonstrations. If he pursues the method of advising without in any instance carrying the advice into operation through demonstrations, there is always danger that the farmer will not follow the instructions carefully, and his few failures on such a course will advertise him much more than the same number of successes. The agent who is wise will always have a sufficient number of demonstrations which he follows up carefully, not only for their effect upon the farmer and his neighbors but as a basis for proving his own worth.

But the work does not consist simply of the making of demonstrations, either in agriculture or in home economics, or in the giving of oral advice. It is necessary that we get a conception of teaching classes or groups as well as individuals. Hence it is important that we should consider the community and community organisation as a primary and necessary step in the development of the best form of county extension work. If there are community centers scattered over the county organized for the purpose of instruction, working with the county agent for the purpose of carrying out the things planned together for the improvement of the community and the farm practices in the community, the county agent will find that he has the strongest type of extension work and his opportunities to take hold of the whole county and organise it for the improvement of agricultural practices, home living, production and marketing, will be almost unlimited.

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I know of a county which has gone quite a distance in organization of the character mentioned. I have been greatly interested in noting the effect of practically covering the entire county with community organizations. In every one of the communities in the county I refer to, there are a large number of actual demonstrations, quite varied in character, conducted each year under the leadership of the county agent. Regular meetings are held and community improvement discussed. That county is gaining an excellent reputation for progress in agriculture, not only within the state but beyond the state borders.

Demonstrations may take any number of different forms and may be of great variety. Sometimes extension workers are not sufficiently thoughtful and do not follow up what they are trying to teach farmers. For example, let us say that the county agent conceives the idea that the farmers of his county ought to grow alfalfa. It would be a serious mistake to try to grow 15 or 20 acres of alfalfa on a 160-acre farm in a community where it has never been tried before, because, even if a success, it may disturb the farm management problems at that time and disorganize the farmer's work. The farmer can be taught the process of growing alfalfa successfully on a relatively small area, and after that is done the county agent must follow it up by attacking the important problem of adjusting the new crop to the whole farm management problem of the farm.

An important part of the work of the county agent in conducting demonstrations is to get hold of the man who needs his services more than his neighbors do. The importance of demonstrations to change the practices of unsuccessful farmers who do not seek the agent should not be overlooked.

How should the specialist operate in carrying on demonstrations? Many men have been employed during the last year in special work, such as dairymen, animal husbandmen, etc. Sometimes these men have been put to work and not given careful coaching. No one devoted much thought to what they were going to do. Sometimes they were going about the state giving advice, a large part of which was never adopted. Their work no doubt had some value, but a large part of their time was being wasted.

Specialists can very easily assist county agents in carrying out special demonstrations. The county agent cannot be an expert on everything. He must be a leader, a resourceful man of broad agricultural training and practical knowledge. The dairy specialist, for instance, can assist him, not only by trying to solve particular problems but by designing carefully planned demonstrations which will be carried out through the county agent, for the purpose of putting the knowledge of the specialist into actual practice.

Sometimes specialists do not appreciate their relationship to the county agents in the conducting of demonstrations. If the specialist goes to the county independently from the institution and approaches the farmer directly, without consultation or reference to the county agent, he does the latter an injury. The standing of the county agent with farmers has been seriously impaired when specialists have dealt directly with farmers, because they teach the farmer to look to some one else besides the county agent. The county agent should be considered the head of agricultural extension work in his county just as much as the extension service which he represents is the head of extension work in the state. To consider the county agent otherwise and to send a specialist to work in the county without working through him, is manifestly bad administration. However, the moment the specialist realizes that he belongs to the same machinery, the same activity that the county agent does, and the moment he presents himself to the people as a

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man brought there by the county agent to assist him in doing his work, that moment he strengthens the county agent in the estimation of the people of the county and strengthens the hold of the extension forces upon the people. By the proper coordination of forces, the specialist can design practical demonstrations along his line, and these can be carried out as a part of the project of the county agent with the assistance of the specialist. What I say about specialists applies equally to specialists who are engaged in club work and other types of extension workers coming from the institution.

I have been attempting lately to get Southern agents to map their different types of activity in order to show where they are conducting different demonstrations on farms and the nature of such demonstrations. These maps are important in showing the county agent where he may be failing to reach a part of his people.

Every modern educational institution, properly so called, has its laboratory course, its shops and its practice work. We are attempting to put into practice the largest system of popular instruction for people not in schools, that was ever conceived of. If we omit the practice work or the laboratory work, we would not be mindful of all that we ought to have learned from the past history of educational institutions. The best way to get knowledge practiced is to get somebody actually to do it. If some one actually does it, that is a demonstration. Repeated demonstrations spread the knowledge until it becomes universal practice.

A DELEGATE. Should demonstration agreements be made with the farmers who are cooperating with the county agent?.

B. KNAPP. We used to do that eight or ten years ago. Nowadays, the county agents handle that matter themselves. There is no fixed rule. Many farmers are reluctant to sign anything. We hold that if the county agent does not know a man well enough to know whether he was really in earnest, we had better not take him on as a demonstrator.

A DELEGATE. We have found that where such an agreement is signed the farmer seems to think that the matter is of some importance and gives attention to it, whereas when the farmer merely agrees verbally to do demonstration work he is apt to forget all about it.

B. KNAPP. That is partly true, and yet we find as a matter of general experience that if you remind a farmer of his promise he will keep it.

A. J. MEYER of Missouri. What proportion of the Smith-Lever funds should be used in field demonstrations?

B. KNAPP. I have no fixed opinion on this matter. Ultimately I would like to see a good county agent and a good woman county agent in every county in each state. I should hope there would be money enough to provide for their adequate support and sufficient for administering affairs at the central headquarters. I should want specialists, not in large numbers, for if the county agents were strong men not many would be needed, but I think at least one specialist should be employed—one strong, able, practical man of the extension type—for each of the main leading subjects that pertain to the agriculture of the state. The state extension service director can figure what proportion of the money would be spent in county agent work, and what proportion would be used in the employment of specialists.

A. J. MEYER. Mr. Knapp considers that all the money that goes to the support of county agents is being expended in field demonstration work. Now, some of us maintain a large force of extension specialists which we use in movable schools. There is a good chance in every state to build up a strong system of movable schools; and they are a very desirable form

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of extension work. Yet if we keep our specialists occupied at these movable schools, they will have but little time to get out into the field. Could the specialists spend six months in the movable schools and six months in the field, or did the framers of the Smith-Lever Act have it in mind that they should spend four months in the field and the rest of the time in movable schools? Is there any ideal in this matter?

B. KNAPP. Not to my knowledge. If movable schools are to be held throughout the state at which the specialists serve, and if much of their time must be devoted to county work also, clearly we shall need more specialists; more than we now have.

At the present time the situation in the fifteen Southern states is about like this; the total funds from all sources used in extension work amount to $1,974,000. Of this sum $1,113,000 is now being expended in county agent work, $377,000 in home economics extension work through women county agents; $194,000 in specialists; $47,000 in movable schools; $84,000 in boys' and girls' club work; $31,000 for publications; and $128,000 for administration. These figures are given in round numbers. I cannot say whether more or less will be spent on specialists in the future.

THE CHAIRMAN. The second subject on our program reads "The Organization of Cooperative Extension Work—Machinery and Method". The general subject has been so sub-divided that it is treated in its various natural administrative divisions: a, In the County; b, In the State; and c, In the United States Department of Agriculture.

The county phase of this subject will be discussed in a paper by Director C. A. Keffer of Tennessee, read in his absence by Director G. I. Christie of Indiana.

COUNTY ORGANIZATION OF EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

BY C. A. KEFFER

Recognizing as a principle of universal acceptance the educational function of the division of extension, it is deemed of the first importance that our work be developed in harmony with all other educational agencies within the county. These are primarily the schools, and in less degree the state department of agriculture, the rural church, national and local farmers' organizations, the agricultural departments of railroads, and state and county social, commercial and financial organizations in so far as they deal with rural problems.

All of these agencies have for their direct or indirect object the improvement of farm conditions. Since the county school is the one continuous agency named that is maintained by taxation and is thus under state control, this paper will be confined to a discussion of our relations with the schools; and the high school, being the head of the county system, will be the particular unit with which it will have to deal.

The function of the division of extension primarily is an educational function. I have said that the recognition of this principle is universal—it would be better to say that the men and women engaged in this work everywhere recognize its educational character, and one of the problems before them is to impress on the public mind their own view. All educators do not accept the division of extension as an educational agency. In the institutions with which we are associated there are many professors today who still adhere

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to a restricted definition of what constitutes a school; and in the county high schools and in secondary schools, and the boards which control them, the narrow view that the work of the school should be confined to the class room is still most common.

The idea that the school is the neighborhood center, from which should radiate not only supplemental influences but direct aggressive efforts for the development of the entire community in all that concerns the welfare of the people, has not yet received general acceptance. It is an idea that appeals strongly, and the more it is discussed the more adherents it finds.

The work of the county agent is to teach by demonstration. It is an application of the laboratory method of the professor of chemistry or botany to conditions which he scarcely would admit as in any degree scholastic; it is an evolution—he might regard it a devolution—of college teaching. Its beginning in America is charmingly hinted in the autobiography of Andrew D. White, first President of Cornell University, when he gives his impressions of the early methods of the Sheffield Scientific School at Yale; and that great educator, himself a pioneer of the laboratory method in his special field of history, had much to do with establishing it firmly as the true basis of scientific instruction in the building up of Cornell. It had a large application in the work of the agricultural colleges, wherein the investigations of the chemists and biologist, no longer confined within the walls of a laboratory, were confirmed in pot experiments and small plots, and carried thence to gardens, fields and orchards for test under farm conditions. With the investigator went the professor and his pupils. The agricultural student of today, receiving instruction in class room, laboratory, stock pavilion, feeding lot, field, and orchard, more and more recognizes no limitation as to place; his realm is as wide as the universe.

But the public school teacher of today, save in very few cases, has not had this broad training. In many instances he went from one rural school as pupil into another as teacher, with only the county teachers' institute and such self-directed reading as he might care to undertake as a means of broadening his conceptions of educational work. Even the graduates of our normal schools, until very recent years, have regarded the school yard fence as the ultimate boundary of their educational domain, though everywhere recognizing their disciplinary zone as including the highways leading to the homes of their pupils.

The farm demonstration agent is a new factor in education. Shall he be an independent worker, cut off from all association with the recognized educational channels of the county, or shall we, realizing the character of his work, coordinate it in every possible way with the schools?

The teacher instructs his classes of boys and girls in the school room; occasionally we find one, of broader vision, carrying these boys and girls into the open for lessons of nature at first hand; and semi-occasionally we find a man or woman in the school who has grasped the great yet simple conception that lessons for his pupils abound on every hand, not only in printed pages, not only "books in the running brooks, sermons in stones and good in everything", but a world of sound instruction in the prosaic work of the farm kitchen, the garden, the barn and the field; a teacher with power enough to lighten the drudgery of what to the boy and girl always has been dull toil, and sense enough to free his pupils from the thralldom of the printed word; in short, an ideal teacher.

The county agent has a new field, and it is all important that he shall have a right conception of it. He must be a teacher first of all, and he should

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have a right idea of his pupils. They are grown-ups. They have learned lessons of experience. Without proper guidance they have many times misinterpreted the lessons, but these have been thoroughly learned, and have been woven into the very make up of the men. It will require skill and a delicate touch to draw out the bad threads from the warp of belief, and a deft handling of the shuttle to put in sound stuff, making all good and strong. And nothing that we can do will make of such material as perfect a fabric as one that was constructed properly in the beginning.

You can argue a mere matter of principle with almost any man, if only you respect his prejudices. And the farmer, even as you and I, has pet prejudices of his own. He may have escaped the influence of the moon, and yet retain a profound regard for the efficacy of the "bull tongue" for all tillage purposes. With many of him, Cotton is and always will be King, and if perchance latitude has prevented allegiance to that mighty monarch, he finds King Corn equally worthy his blind and loyal devotion.

But however conservative he may be, he is susceptible to instruction by the laboratory method. Both the boy in the chemical laboratory and the farmer in his field, are there to be shown; and the resourceful agent, no less than the resourceful professor, will see that the test is interpreted correctly and applied properly.

More and more the county agent is recognising the community as his unit and not the demonstration. In this he but conforms to the idea of a school. Manifestly it is impossible for the agent to work on every farm in the county; but if he succeeds in establishing a few demonstrations of varied character in communities let us say of a three-mile radius, he will be able to carry all the people of these different demonstrations; one may be clover, another cotton, another beef feeding, another gardening. Varied lines of farm work, and equally varied lines of women's work thus may be conducted at the same time in a community, and field and home meetings will make all available.

As the work develops each year new demonstrations are begun in every neighborhood; and all the time matters of general farm and home management are under consideration. Thus there grows, from a community interest in production, a logical organization which manifests itself in cooperation for buying and selling, as well as for observance and study, leading to a thorough county organization for all forms of rural development.

We do not want the kind of organization in the community that is revealed in the school. The agent cannot have mastership thrust upon him by a board. His leadership must be felt by his fellows, not worn as a garment by himself. His school is a pure democracy, and soon its inspiration and direction will pass from the one man, because it will have become a part of all. In our present development, however, formative influences are necessary; and I plead for a close relation between the county school system and the division of extension in its county work.

The advance guard of the teaching profession in public school work already has recognized the need of extending the influence of the school into the life of the community. In Knox county, Tennessee, in the Farragut school, we have an institution that was conducting well planned extension work before the farm demonstration work of the United States Department of Agriculture was thought of in the State. For several years past, the Grove high school at Paris, Tennessee, has engaged in extension work throughout the county. Extension division workers cannot prevent the spread of this movement in and through the schools; it is proving its worth, and is bound to grow. Shall we, by hearty cooperation with the school authorities, place

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ourselves in position to direct this extension service and unify it, or shall we find ourselves in a few years confronted by rivals less well prepared to serve the cause of rural development, but strongly intrenched in the public school system where they can thwart every effort we may make to secure local financial aid, dissipating a vast amount of energy that should be conserved and directed by a central organization with definite aims and a well considered system?

In Tennessee we secured the cooperation of the State Board of Education, with the hearty concurrence of the Office of Farmers' Cooperative Demonstration Work. Through the state board an arrangement was made by which the county agent might be employed jointly by the county high school board and the division of extension and the Office of Farmers' Cooperative Demonstration Work. He was to teach four days per week during three winter months, and devote all the rest of his time to field work. Necessarily the plan was not entirely satisfactory: on the one hand the schools found it difficult to arrange their schedules on this basis, and on the other the time of the agent can be employed profitably in field work throughout the year. But as a result of a year's trial many rich suggestions developed that convincingly prove the value of a close relationship between the schools and the demonstration service.

Without exception, the county agents report the experience of teaching of decided value to them, not only because it gives them opportunity for study of which they might not otherwise avail themselves, but because it helps them in their field meetings to make a more logical presentation of farm lessons to the farmers. Much of the value of demonstration work lies in the proper discussion of reasons and methods employed, in field meetings where men come together at a demonstration for a lesson based thereon. Contact with high school pupils, coming as they do from all parts of the county, gives the agent an opportunity for intimate acquaintance with the young men and women who in a very few years will be leaders in their several communities. It must not be forgotton that the high school, no less than the college, is composed of picked boys and girls, who are there either through their own or their parents' efforts, and who represent in every county and state the progressive element of the population. It is a good thing for the county agent to come into intimate relationship with these chosen ones, who will be ready to unite intelligently in the work of neighborhood development after the association of the school.

Gradually the schools are providing demonstration plots, which may be used for the instruction of their classes. Why confine their use to the registered pupils? Why not make them available for the farmers of the community as well as for the pupils of the school? In several counties in Tennessee this plan has been initiated. Difficulties have developed; but already enough has been accomplished to prove that here is a great opportunity for bringing to the school a more direct and acute interest of patrons. All that is needed is the adjustment in each individual case of the general scheme to fit local conditions.

Three counties will serve to indicate different phases of the relation of demonstration and school work in Tennessee during the year: in White county the county agent taught in the high school during December, January and February, four days a week and devoted all the balance of his time to demonstration work. The school has a three-acre tract of uniform soil that is devoted to demonstration plots, which are worked under the direction of the county agent and are used for class instruction and in farmers' meetings.

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While the school would prefer the continuance of teaching work throughout the year, the principal expresses himself as highly pleased with the arrangement; and the field work of the county agent has given general satisfaction. Already the high school is being looked upon by the farmers as their source of information and assistance in farm problems.

In Fayette county, our county agent devotes his entire time to demonstration work. There is one county high school which employs a teacher of agriculture and the sciences. Early in the school year the teacher and the county agent began working together to the manifest advantage of both. The teacher frequently assisted the agent at his field meetings, and as the agent had had no college training, though a man of large experience in the methods of farming pursued in that part of the state, the teacher, an agricultural college graduate, was able to strengthen these meetings in many ways. On the other hand frequent contact with farm problems kept the teacher alive to the necessity of making his instruction more practical probably than it would have been without such stimulus. Agent and teacher, in their rides over the county, discussed the agricultural problems confronting them; both were benefited, and have a wider vision which must be evidenced in their work hereafter in farm and in school.

In Hamilton county there are five high schools, one a suburban school at Chattanooga and the others in rural centers. The teachers in agriculture in the four rural high schools are employed for twelve months, and during the summer vacation work as community assistants to the county agent, who is supervisor of agricultural teaching in all the schools, doing no teaching himself. Already the idea of community organization is well established in this county, and the close relationship between the high schools and the demonstration work is giving splendid results.

Whether the county agent teach in the school or not, he should be recognized as a member of the high school faculty, and its representative before the people of the county. It is not desirable that he teach but if funds are too limited to employ both an agent and a trained teacher of agriculture let us accept the compromise of part time teaching in beginning the work rather than run the risk of two agencies attempting demonstration work. In the natural course of growth additional means will be provided and in the meanwhile proper relations will have been established and the work will have been started in right channels.

To secure this end we can well afford to give to the high school full credit for whatever may result from our combined efforts. We recognize the high school as the head of educational agencies in the county. Let us bend our efforts to wise direction of its work in agriculture and home economics, within and without the school.

Having in view the purposes laid down in the Smith-Lever Act, which is our charter, we suggest the following as a working basis with the county high schools in extension work. In some states the school organization differs from that indicated herein, but adjustments can be made to suit all such cases.

(1) The county agents (men and women) to be appointed jointly by the division of extension and the United States Department of Agriculture, and approved by the county high school boards.

(2) The county high school boards to join the division of extension in securing financial support for maintenance of extension work from county courts and other local agencies. When such aid is secured the county agents shall teach in the high schools if desired. (see 6)

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(3) The division of extension to appropriate a substantial part (at least one-third) of the funds necessary for extension work in the county.

(4) Supervision of county agents to be under the division of extension.

(5) Agents to be members of high school faculty.

(6) Agents may teach in the high school three months, five days per week; or all their time may be devoted to extension work with the high school as headquarters, the plan to be agreed upon mutually by the high school board and the division of extension.

(7) Where there are several high schools in a county, the county agents may act as supervisors of agriculture and home economics teaching, and the teachers may be employed for twelve months as assistants to the county agent in their several communities during the school vacation.

(8) Where there is a single high school in a county, and the agents do no teaching work, it is desirable that the county, agents and the teachers shall aid each other in all possible ways.

(9) When no teaching is done in the high school, agents may conduct short courses in agriculture and home economics at the high school for farmers and women who are not pupils of the school.

(10) Agents may aid the regular teachers in planning field and home work for regular pupils.

(11) Agents in all their work shall represent the high school.

(12) The county agents may meet with the county teachers' organisations to encourage and instruct them in the teaching of agriculture and home economics.

I. P. ROBERTS of California. You are trying to reach the farmer. Why not reach him through the children indirectly? I may say that a half century ago the only way I knew of interesting the parents of my scholars in a district school in a new country, was to send the children home redhot with questions; and I got every household that winter discussing those questions without my presence and bringing the conclusions back through the children. For instance, I would ask a pupil, "When is the best time to cut clover and timothy hay"? That stirred up the question of haying; and then I would try to explain in as few words as possible why we cut the timothy and the clover in June. I did not get down to the real scientific reasons; I merely told them the facts and left them to trust me that I was correct; and it would revolutionize the whole industry in that section.

Now, later, at Cornell University, we conceived the idea of teaching the teachers. We did not reach the place we wanted to, because instead of the country school teachers coming to us for instruction during the summer, over a hundred schoolmarms from the city came to take a short course in agriculture. We tried it another year and then abandoned it. We could not reach the country schoolmarms, for they did not get enough money to enable them to come to Cornell University and pay their board bills.

Now it seems to me the secret of this whole thing is to get at that country school teacher. They need not know all there is in agriculture, but they can learn certain fundamental principles. Every one of them should be required to attend a school at some central place, and take a summer course in agriculture, propounding just such questions as those I have suggested. And their board bills should be paid for them by the State.

See how simple it is, if you will only go at it in the simple way of an old farmer. Ask, "My boy, how many pounds of milk do your cows give?" as the first question. They will come back, "We don't know"; but they will get their parents' scales and weigh it. Now you can explain the difference

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between a debtor cow and one that pays a profit. Then, "What are the principal constituents in milk?" We introduce a new vocabulary into that farmhouse. They cannot help themselves, because that child is the apple of their eye and the child shall teach them. That old gray-haired farmer won't listen to you a moment. He says "That teacher who parts his hair in the middle doesn't know anything". But the child says that the principle constituents of milk are butterfat and casein and milk sugar and the like. And then you ask: "If I had a hundred pounds of butter fat, how many pounds of butter will it make?" Let them take it home and discuss it. There are all sorts of questions, and by and by you will get up to the higher teaching, and you will get those farmers to learn through that child to know that the Lord has put all the water in milk that should be there.

THE CHAIRMAN. The consideration of the next phase of this subject is "Organization in the State". The message on this subject is prepared by Director B. T. Galloway of New York, whose paper will be presented in his absence by Mr. Coshin of California.

THE ORGANIZATION OF COOPERATIVE EXTENSION WORK, MACHINERY AND METHOD (IN THE STATE)

BY B. T. GALLOWAY

Cooperative extension work in agriculture is still in a formative stage; furthermore, conditions in the states vary widely, so that it would seem neither safe nor wise at this time to attempt to outline a definite plan of organization that would be applicable everywhere. Without doubt, the states that are now fairly well organized and are pushing their work along clearly defined lines will find it necessary to make many modifications in the light of experience as the work proceeds. There are certain general principles, however, that would seem to hold everywhere, and it is these that we propose to discuss rather than matters of detail, which must be left largely to those in charge of the work.

THE COLLEGE HAS THREE FUNCTIONS

Judging from numerous inquiries and from projects we have had opportunity of noting, there is still considerable haziness as to the field that an extension service properly may cover. As fundamental to proper organization and method, it should be kept in mind that an agricultural college has three clearly defined functions: namely, (1) research, or the acquiring of knowledge; (2) resident instruction, or the formal teaching of existing knowledge; and (3) extension, which primarily is educational and is carrying agricultural knowledge to the people rather than requiring the people to come to a prescribed place to receive the knowledge. We use the word "knowledge" here in its broadest sense, meaning all those things that make for the betterment of rural life—material, social, and recreational. The point we wish to emphasize is that an extension service presupposes the existence and availability of knowledge to extend.

The dominant idea pervading the Lever Extension Act is that there is a vast amount of existing knowledge to be made available to the people, and the act provides the means and prescribes the methods for making it available. It is evident, therefore, that in the organization of extension work, especially that which is to be supported out of Lever funds and the state's contribution thereto, experiments, investigations, and surveys designed wholly or in part

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to secure new facts can have no place. On the other hand, it would seem perfectly proper to conduct trials, tests, and demonstrations in the fields, barns, and elsewhere in order to bring more clearly to the attention of farmers and others the vital point of a known fact.

LINES OF CLEAVAGE NOT DESIRABLE

So much for the work to be done; now for a few words as to administrative organization. I am convinced that any plan of organization that permits lines of cleavage between different groups of workers will not bring the best results. Hence, I would not advocate separate administrative groups under research, teaching, and extension. Successful administration in all such work will depend greatly on the development of a proper cooperative spirit and the realization that the thing to be sought is a group of men devoted to a purpose, rather than a piece of machinery designed and run because it operates as a good machine. Even the best machines are faulty. They require much care and adjustment, and it happens not infrequently that a considerable force must be ready to prevent the real or fancied encroachment of other machines.

We believe, therefore, that the most feasible, efficient, and altogether satisfactory method of organization is to center the chief administrative authority in the president or the dean of the college, who will have power to delegate various activities to individuals, committees, or groups of men as necessity arises. Each subject-matter department of the college, including a department of extension teaching, may have its workers in research, teaching, and extension, with the office of the president or the dean serving as the clearing house for the various activities. Such a plan permits of complete mobility; it is capable of unlimited growth, as experience has shown; it enables the administrative head to organize his forces so as to put emphasis on the problem rather than the method; and it is a powerful agent for the development of a spirit of cooperation and democracy, without which no institution such as a college of agriculture can do its best work. It may do these things, furthermore, without interfering with departmental autonomy or integrity, keeping always in mind the fact that it must be the college as a whole that expresses itself through its extension activities, and not merely a part of the college. In such a plan there is a place for a department of extension teaching coordinate with the other departments of the college and properly functioning in research, teaching, and certain types of extension activities.

THE FIELD FOR EXTENSION TEACHING

It may be well to elaborate briefly upon the functions of a department of extension teaching. As extension activities develop and funds become available for growth, it will be necessary to study and ascertain the best methods of conducting the work. There will arise necessarily questions as to methods of organization, and these questions can be answered only after careful study, so that research will be required.

There is also another very important field; that is the training of teachers qualified properly to conduct extension work. With the wonderful growth that these activities have had in the past few years and the promise of future development, due to the cumulative funds from federal and state sources, there will be felt more and more the need of men and women well trained for service. It is very evident that we must give careful attention to the courses of study and educational philosophy that must prevail in the training

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of such persons. Educationally the problem would seem more difficult in some respects than training for research. Experience has shown that it is more difficult to secure the adoption of existing knowledge than it is to acquire new knowledge. Special attention, therefore, must be given to the perfecting of courses of instruction, through training of teachers in extension work; and this, together with the training of teachers for the regular work of the colleges and secondary schools, will become a very important duty of our agricultural institutions.

The growth of extension work and the demand for extension teachers probably will have much to do with bringing about a movement toward the perfecting of collegiate courses of instruction for all agricultural students. The agricultural colleges have been backward in this matter of training teachers in agriculture and mechanic arts. In a report made by a National Commission on Vocational Education, which resulted in the formulation of a vocational educational bill, it is shown that of the appropriations amounting to over two and one-half millions of dollars made by Congress under the second Morrill and Nelson Acts for the year 1912-13, less than thirty-four thousand dollars was expended in the training of teachers for agricultural work. We would regard it, therefore, as a legitimate function of a department of extension teaching, coordinating with a properly organized department of rural education in the college of agriculture, to prepare men and women for the important field of extension service.

A CLEARING HOUSE FOR COLLECTIVE EFFORT

A department of extension teaching may also function in another important way, and that is in organizing and administering collective effort such as may be involved in the conduct of movable schools, organization of reading and study clubs, farmers' week conferences, joint lectures, management of demonstration cars, exhibits at fairs, and the like. The department of extension teaching may take the initiative in organising collective work, or the administrative head of the college may group the men, using the department of extension teaching as a clearing house. On the other hand, there may be lines of extension work intimately connected with the activities of the experiment station, or the college, which can be directed best by the subject matter department. Or it may develop that men from two or more subject-matter departments may unite in an extension project. The work in such instances would clear through the office of the president or the dean. The plan here suggested may appear complicated and difficult to put into effect, but after all it is comparatively simple. There is abundant evidence that attempts sharply to divide responsibility and to group more or less artificial divisions under separate heads, leads to the development of lines of cleavage and twilight zones. The latter especially are objectionable in any institution such as a college of agriculture, for men get lost in them, and it may take more time and effort to find and keep track of the lost ones than of those who are out in the light.

THE USE OF PROJECTS OR PLANS

So far we have dealt with the chief essentials of organization; namely, subject-matter departments doing research, teaching, and extension; a department of extension teaching, coordinating with other departments; centralization of administration in the office of the president or the dean; and the organization of team work, using the department of extension teaching as

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a clearing house for certain types of collective effort, and the office of the president or the dean for all major projects, or project groups involving one or more specialists. A thoroughly developed project plan is essential to the best success, and extension work lends itself admirably to such a plan. Upon the manner in which the projects are formulated and the work assigned will depend much of the success of any scheme of organization and method.

Projects should be clear-cut, but should not be too much subdivided. Projects should indicate clearly the leader and his associates, if such there are. Careful attention should be given to the nomenclature of the project, the object or objects to be attained, and the method of procedure. Cooperative relations and financial responsibilities and liabilities also should be fully set forth. The projects may be so grouped and tabulated as to give almost at a glance a sort of graphic picture of all the extension activities of the institution, such as the persons involved, the places where the work is being conducted, the relationships with other organizations within the State or the Nation, the cost of the work, and the objects to be accomplished.

THE PLACE FOR THE COUNTY AGENT

In any consideration of principles that should govern in the organization and method of conducting extension work, we must give thought to the place and function of a county adviser or a county agent. I think it can be stated without question that our ideas regarding the place and function of this very important officer will undergo rapid changes in the next few years. In the evolutionary process now under way, the county agent in many places is becoming something more than an adviser on crops and animals. He is a community builder, and as such he must be more a part of the community than he is of the college, or of any other institution with which he is associated. When the first steps were taken in a Southern state twelve or fifteen years ago, inaugurating a movement that resulted in the farmer's discovery that he could help himself, a great advance was made. We must aim now to develop this spirit in whole communities, so that they will learn to help themselves. Any one who has studied the subject knows how very slowly one may reach farmers by individual, personal contact. With agents in every county in the United States, acting merely as advisers, it would be long years before much of an impress could be made.

What, then, shall be the rôle of the agent? Briefly, he should be a joint representative of the people in the county, and of the college, the Federal Government, or any other agent or agencies that may wish to help him—or that he may wish to have help him—in organizing all available forces for better farming, better business, and better living in his community. For the college or any other agency to attempt to dominate or to stereotype this work would be very unfortunate. Through the agent, the college may seek to arouse the community, but unless the community itself arouses and puts effort, money, time, and energy into the work, it will be lamentably slow. A county agent should know his people and the local conditions, but he must be an organizer and a user of men, rather than an individualistic peripatetic dispenser of knowledge. In other words, the county agent must become an organizer of forces, and must learn to use these forces, under the guidance and help of the college, in the building of the community he represents. With the communities properly organized and feeling a direct interest in the work they are doing, growth will be natural and lasting, for it will come from within.

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It is important that the county agent also should have clear-cut projects, some of which may be general in their nature, some less general, and some quite local. By a proper articulation of the county agent's work with the college, all activities in the county may be properly coordinated. While the county agent, therefore, strictly speaking is not a part of the extension machinery of the college, he is in a position to use all of the extension machinery, including the specialists and experts, whenever occasion demands.

SUMMARY

Let us now summarize briefly some of the essential points that should be noted in connection with organisation and method in extension work.

(1) Extension work primarily is an educational movement. It is carrying agricultural knowledge to the people rather than requiring the people to come to some prescribed place to receive the knowledge.

(2) By virtue of the Morrill Land-Grant Act, the second Morrill Act, the Nelson Amendment, the Hatch and Adams Acts, the Smith-Lever Act, and by state legislative enactments in most of the states, the land-grant colleges have come to be recognized and designated as the proper educational agencies in the respective states for the conduct of agricultural extension work provided for by state and federal funds.

(3) The land-grant colleges of the respective states should be regarded as the smallest units through which the Federal Government will function in cooperative extension work within the states.

(4) Each department of the college, including a department of extension teaching, may have its extension professors, assistant professors and instructors, for developing subject-matter projects. The more general collective forms of extension work, such as extension schools, farm trains, fair exhibits, reading courses, and the like, may be conducted through the department of extension teaching, as a department coordinate with the other subject-matter departments of the college, the office of the president or the dean should be the coordinating and clearing office for all departmental and college projects.

(5) As an agency for field service, the county farm bureau is recommended. This should be a local organization and not recognised as a part of the extension work of the college proper. In order to provide the necessary administrative machinery for handling such county farm bureaus as may be organized, there should be a state leader, provided with such necessary assistants as may be required, who will be located at the college of agriculture. Subject to the approval of the president or the dean of the college, cooperative projects with the farm bureau agents could be made operative through the state leader of farm bureaus. A county farm bureau, therefore, is a local organization of farmers formed for the purpose of providing necessary machinery for collective effort in attacking the problems confronting the farmer and the farm woman. It is also a local headquarters or clearing house for agricultural information and for the extension work of the college of agriculture and such other agencies as may wish to cooperate. The county farm bureau agent, or the local officer in charge of the farm bureau, is the representative of the local associationor or ganization back of the bureau, of the State College of Agriculture, of the United States Department of Agriculture, or of other agencies that may be cooperating.

G. I. CHRISTIE. Am I to understand that Doctor Galloway favors a plan which makes the county agent chiefly the representative of the county

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bureau, without any relation to, or not under the immediate direction of, the college?

THE CHAIRMAN. This question is pertinent. Does this Association favor the organization of a county farm bureau independent of the college? Perhaps we might leave the consideration of this question until the report of the committee on extension organization and policy had been read; but it is one that deserves careful consideration. We would not feel in Oregon that the county agent was a college representative if his efforts were being directed by a county bureau. I would like to know what the members think about it.

L. A. CLINTON of Washington, D. C. The scheme is working in New York State and working well. The local farm bureau really directs the work of the county agent and has complete authority in connection with the work, just so long as it wishes to do the right thing; but the state leader always has the veto power. If, for example, the farm bureau desires its agents to do buying and selling, the state leader, as the representative of the state college and of the Federal Department, informs the farm bureau agent that he cannot buy and sell, and explains why. The bureau people accept the decision, for they recognize that they are a part of a state-wide and nation-wide system of education and that the agent is a public official.

I might say that in discussing this matter of a local farm bureau in states other than New York, men have said that they did not want a farm bureau because they were afraid that its officers would make just one more set of bosses. They preferred to be directed from the state college rather than to have local people bossing them in their work. Nothing need be feared, however, from a properly organized and directed farm bureau.

A DELEGATE. It seems to me that is rather an imposition on the local bureau to lead it to think it is directing when really it is not. We do not understand the spirit of this work in that way. In my district to my knowledge the people wish the direction of the state college and of the Federal Department. They feel that they have a right to demand it, and that they need it.

A DELEGATE. How are these farm bureaus organized? Who constitutes the governing body? Who maintains this bureau? Does it contribute to the county agent's salary?

L. A. CLINTON. The starting point of the farm bureau is with a few men in the county, perhaps a chamber of commerce, or a board of trade. Usually they make application to the state college or to the Federal Department. Then the state leader discusses the matter with these few men as a nucleus, explains to them the farm bureau work, the need of an organization representing the farmers of the county, not merely an organization of business men like the board of trade or chamber of commerce. If they conclude that it is a good thing and that they are ready for the work, a campaign is launched, the object of which is to interest the farmers in the movement. The state leader comes back later to meet the people in the county who are interested in its organization. There may be a hundred or more at the second meeting. He explains the scheme to them; that it is an educational movement; that the bureau exists in order to give local control, direction and support to the work. If they wish to go ahead, they organize, elect a president and executive committee, secretary and treasurer, and open a membership book. The membership fee is usually a dollar a year. They try to have the membership represent the farmers in every section of the county. They try to steer clear of having a chamber of commerce or board of trade direct the movement. While the support of the business men is

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always desired and the chambers of commerce have been of great assistance in forwarding the movement, yet farmers must lead if success is to be insured. The largest organization in New York has a membership of about 800. A part of the expenses are borne by the membership fees. The local association says through its officers to the board of supervisors, "We want an appropriation; we want $1500 to $2000, or such amount as may be needed properly to finance the work. We want the necessary money to furnish local support for this work which will bring to us the state aid and federal aid."

When I say that the farm bureau association does the thing it wishes to do so long as it wishes to do the right thing, that expresses it exactly. The members recognise the power of the state leader in controlling this work, that he represents the public, that they in their county are only a part of a larger system. It is only to be expected that the local people sometimes may not know just what may be wise; then the state leader will set them right. They are always glad to have the benefit of his guidance and experience.

THE CHAIRMAN. Perhaps we are not so far apart after all. Some of us probably start from the other direction. We have found a number of farmers interested, and they have gone to county boards and requested appropriations, and requested that the college and the Federal Department unite with them in attempting to get a county man. He is selected and employed, and often he has much to do with getting the organization well under way, largely after he arrives.

C. OUSLEY of Texas. It seemed to me from the brief allusion to the subject in the paper by Doctor Galloway, that this bureau movement was a scheme whereby a progressive body of farmers took advantage of the department and college in order exclusively to utilize the services of the county agent. If that is what the bureau means, then it is an unwholesome movement. The whole tendency of agricultural education is to benefit the man who is already progressive. It does not reach the man who is in the most need, the neglected man, who neglects himself, who does not seek knowledge, and to whom the college and the department, through the county agent, should go as a missionary. I can see great value in a body of men organised to promote agricultural development in the county in the manner just related; but I also see grave danger that this body of progressive farmers will monopolize the services of the county agent, that the great missionary work of this service will thereby be hindered, that we will not benefit those who need our services most vitally. One of our great problems as I see it is to benefit the man who is not himself cognizant of his own lack of knowledge. It is for the county agent to visit him on his farm and, diplomatically of course, to force knowledge on him.

K. L. HATCH. A working plan that will serve a particular county in New York may not do for Pottawatomie County, Oklahoma. The type of organization must be according to the progressiveness of the farmers and the economic and educational interests of the county. Above all things the county agent must represent the farmers. The great mistake that has been made in many county organizations is that they have been controlled by business men. I am not an extremist in this matter, but I have seen many county organizations fail because of the clash in economic interests between the business men and the farmers. The county agent must be absolutely free to serve the broad business interests of the farmer.

The strongest organization with which I am acquainted is the representative organization of the counties. If this organization, under the guidance of the state institution, can go into a county and create community organization and a central agricultural association—I do not care what you call it; call it

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a farm bureau—which actually are representative bodies, made up of delegates from the communities that take in the whole body politic of those counties, agriculturally speaking, then you have the right sort of an organization. The danger that I have pointed out has been met in some farm bureaus, where the county agents found that on account of the fees which the men paid they demanded his services. Five or six hundred farmers in a county can well occupy the entire time of a county agent, leaving him no time to go out and get hold of the three or four thousand farmers that may be outside of that body. He should be independent. However, the delegates from these local organizations may be his assistants in shaping the agricultural policy of the county. They may handle the business end of the scheme, while he gives advice on methods of cooperation, etc., and deals with the great fundamental problems of getting at knowledge and setting it forth. In using these local organizations we must develop local leadership, so that the farm bureau, that is organized not with six hundred farmers but of one hundred men, who are the delegates of local organizations of farmers, can do the county work. I believe we will then have the type of organization that will support the county agent and enable him to go forward advantageously.

S. F. Morse of Arizona. The great problem of the county agent in Arizona is to interest the farmer. There is no better way to arouse his interest than to get him to take an interest in his own welfare. If we can let him see that he has something to say about the work that is being carried on for his own welfare, we secure better results.

The Arizona plan in starting our work is to organize these county associations somewhat along the lines mentioned by Mr. Knapp, namely, forming local associations and making the delegates of the local association, an advisory council. In drawing up the constitution of our county associations we state that the advisory council, in consultation with the farm advisor, shall plan the farm development of the county under the supervision of the state leader. The farm improvement association plans the work as long as they are going on right lines. If they attempt to dip into politics or if unscrupulous leaders attempt to gain control, the state leader puts his foot on the movement.

The farmer ought to feel that he has something to say about the matter. This is essential if we are to get the farmers working along right lines. If we do not get the farmers interested, we shall lose our influence. We must develop the community idea. The county agent must develop an organized county plan and get the whole county to follow it; otherwise we get nowhere. Farming in one of our counties has been almost a complete failure. It is the richest agricultural county in Arizona, but there was no continuity of effort. One year the farmers raised cotton, the next year sugar beets, and the next year something else. They got nowhere. This year is the poorest in the history of the county. They need a comprehensive plan and I think the farm improvement association will bring about its adoption.

The Chairman. We are all arriving at about the same point; the Federal Department and the college, through whatever advisers they may have in the field, feel responsible for seeing that the work is properly directed. They also recognize the value of having local people exercise as much initiative as is possible. Consequently they attempt to bring the two forces to develop their proper relationships and to get the local people operating as quickly and at the same time as wisely and effectively, as possible. This, it seems to me, is our goal.

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The next phase of the general subject, which you will recall is "The Organization of Cooperative Extension Work—Machinery and Method," has to do with the Federal Department.

This will be discussed by A. C. True of Washington, D. C.

A. C. TRUE. We are acting under the Smith-Lever Extension Act and under other state and federal legislation with what is definitely understood to be by the people who made the law, and by the people who are set to carry out the law, extension work. Whatever agents are employed under the Smith-Lever Act or under state or federal acts which provides for extension work, are necessarily extension agents.

This is a movement of *cooperative* extension work; and we desire therefore, to have it a matter of cooperation, not simply between the Department of Agriculture and the state institutions, but also with the people for whom we are to work; and it is for that reason I judge that we desire to have organizations of farmers under this cooperative enterprise. But whoever enters into this work should know in advance and all along that he is taking part in extension work, and there is, I think, every reason why in dealing with the people as well as in considering the matter among ourselves, we should be perfectly frank and open with them in this matter.

It is, in my judgment, absolutely wrong to try to lead the farmers of this country to believe that they are the people who are to initiate and carry on this work. When they form themselves into organizations and agree to come within the system which is being established for extension work, they become, of course, necessarily a part of that system. They may organize for any other purpose wh ch they desire, and carry on the thing independently, of their own initiative and on their own responsibility; but when they come into this system they must work in accordance with the legislation and principles on which the system is established. And it is with that principle in mind that the organization is being established and managed in the Department.

I personally have been so busy with the work connected with the making of the organization for extension work, especially in the Department of Agriculture, that have not had the time to prepare a carefully worded paper, and therefore I am obliged to say to you whatever occurs to me at the time. I have been very busy for some time in assembling the parts of this machine and getting an ample supply of gasoline, so that it will be very active in its operations, and also a good supply of oil, so that it will run smoothly; and we have tried to take into account that it may be well for us to have a very generous supply of this latter material, so that we may furnish it in ample quantities to those who may be in need of it.

Our organization in the Department of Agriculture for extension work begins with the Secretary of Agriculture. It is his business to establish the general policies for this work on behalf of the Department, to appoint the agents who are to carry on the work, and to approve the projects for extension work after they have been put in as good form as may be by the people further down the line. Then, for the purpose of conducting the work within the Department in detail, we have a States Relations Service, which will deal with the state agricultural colleges in all their relations with the Department of Agriculture. These relations in one way or another cover all the divisions of these colleges, the teaching, the research, and the extension work; and all these things have such intimate and important relations with each other that we feel that by having one organization in the Department which will deal with these matters comprehensively, we shall best be able to carry out our functions with reference to extension work as well as along other lines;

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so that the fact that the States Relations Service is to deal with all the divisions of the work of the colleges will, I think, be an element of strength as regards the work of the Department in its relations more particularly with extension work.

The States Relations Service is divided into a certain number of offices. We have the office of its director, which includes those branches of the service that deal with the work of the service in a general way, the chief clerk's office, the accountant's office, the library, and the editorial division. We have naturally a large amount of routine business which must be dealt with by a single branch of this office, and that belongs to our chief clerk. Then we have to account to the Treasury Department of the United States and to Congress for considerably more than a million dollars this current year; and we must then have a thoroughly organized accounting office. In its library we seek to assemble the publications of the colleges, stations and extension divisions, and to do a very considerable amount of bibliographical work connected with all business along all these lines. That branch of the library's work which deals with extension matters is comparatively new, but we want to make it useful in a high degree to the extension work, and we should be glad to get your views of what we ought to do in that line, and to help you in any way that we can in services of this kind. Our editorial division will have general supervision of the publications which the service will issue, and we hope to issue a considerable number of extension publications. And I might say here that the Secretary of Agriculture has recently given his approval in a very cordial way to the idea that we shall have in the Department of Agriculture an extension publication which shall in a way be comparable with the Experiment Station Record, which we have had with reference to research work, and we will be glad to get suggestions as to what such a pub. cation should contain.

For the present the work that relates to agricultural instruction will be under the immediate general supervision of the director of the service. This is partly because that work at present is not sufficiently large in its scope, owing to the comparatively small amount of money which we can put into it, to make it seem desirable to create a regular office. The same thing is true of the work which we are doing directly with reference to the farmers' institutes, and certain studies along extension lines, which hitherto has been in charge of a farm-institute specialist, an arrangement which will be continued for the present.

The Office of Experiment Stations is retained as part of the States Relations Service. There are two offices of extension work, one for the fifteen Southern states and another for the thirty-three other states in the North and West. There is also an Office of Home Economics, which is essentially a research office, to study the problems included within the general subject of home economics. This, as most of you know, is a development of our nutrition investigations, and now includes investigations with relation to food, clothing, household equipment, and household management.

The Offices of Extension Work are organized each with a chief, who has general charge of the work under the Smith-Lever Act, the Farmers' Cooperative Demonstration Work, and any other forms of extension work with which the service will deal. Under the chief are in each case an assistant chief and a small number of men who will deal directly with different regions or large districts in the United States. There are also persons in charge of our work relating to boys' and girls' clubs, and special enterprises relating to farm management demonstrations and home demonstrations.

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Under the Smith-Lever Act the Department has been arranging with the States for cooperative extension work and has, as most of you know, entered into an agreement, under the name of a memorandum of understanding, by which all the work of the Department relating to extension work in the States is to be done through this States Relations Service, and so, more definitely through these Offices of Extension Work within the service.

The different bureaus of the Department may, and to a considerable extent do, engage in extension work; but the plan for this work and in a large sense the general supervision of this work, are carried on through the Offices of Extension Work, so that any bureau in the Department desiring to engage in extension work is under obligation in the first place to make its plan somewhat definitely, and then to consult with the officers in charge of extension work in the Department, and through them to carry out this enterprise to the colleges in order to find out whether the states are prepared or desire to enter into cooperative relations along this line.

I speak of this definitely now because during the past year this arrangement has not been in complete operation, and because in some cases agents of the Department have gone to the states perhaps without taking the States Relations Service or, as it was last year, the States Relations Committee, into account; but I am sure now there is a clear understanding on that matter, and that the institutions may expect that the work of the Department relating to extension will be inaugurated through the States Relations Service, as represented particularly by its extension officers.

The cooperative nature of this work under the Smith-Lever Act and under the agreements which the institutions have entered into involving the use of direct departmental funds, make the Department of Agriculture very definitely a partner in the enterprise, and it is in that spirit that we desire and aim to work with the state institutions.

In extension work there is, I judge, nothing to conceal. It differs, in my judgment, somewhat in that respect from research work. The investigator, naturally, feels many times that he ought not to divulge the exact nature and details of his work for various good reasons, and the Department through its Office of Experiment Stations has taken that factor in research work definitely into account in dealing with the state institutions along that line. In extension work there does not seem to be any reason why all parties to the business should not know quite fully what is going on, and it is very desirable that the Department of Agriculture and particularly, of course, its extension offices, should know not simply the general plan of operations in the states, but the details of the workings of that plan. This is not in order that we may interfere with or supervise the details of operations in extension work, but that we may have in the Department the data which will enable us thoroughly to understand how this system is developing and what its needs really are. We shall therefore ask the states to furnish us with information about this work at present in considerable detail, because we believe that in that way we can in the long run best aid the institutions. We are in the position of persons who are studying this extension movement not simply with reference to its development in a single state, but with reference to its development throughout the country and throughout the world, and for a considerable time one of our important functions, as we look at it, will be to study this matter so closely and definitely that we can have a very comprehensive view of the whole matter and thus be able to make suggestions and to exert ourselves in helpful ways with reference to the whole enterprise. And so we are asking, and the states generally are very cordially responding,

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for detailed information in the way of written reports from various classes of agents engaged in the work.

We shall also undertake to carry out in our extension enterprise a principle which we have carried out in our enterprises hitherto with reference to the research work of the state institutions. We have been charged for a considerable time in the Office of Experiment Stations with duties under the Adams Act, and from the beginning we have believed that we could feel more fairly and justly with the state institutions as regards the expenditure of their funds and questions relating to compliance with the law, and also as regards the acquiring and furnishing them with information if we dealt with them personally rather than simply through written reports. It has been for this reason that we have sent our agents in the Office of Experiment Stations into the states to consult personally with the people engaged in research work in the state institutions; and we have tried to do that in a proper spirit, and we have, I think, had some measure of success in getting on well with the people engaged in this work; and I am sure that we have been able to help them in many ways.

We have also dealt more justly with them as regards questions growing out of legal matters relating to the expenditure of their funds than if we had simply sat in Washington and received written reports which they might send to us. And this same principle of personal contact with the extension workers in the states we desire to carry out in this cooperative enterprise.

Now, we understand perfectly well that as this extenson enterprise develops it is becoming a very large and complicated matter, that we have different classes of agents within the states, and a certain hiarachy of responsibility and authority, and that it is not only desirable but absolutely necessary to success that the Department shall observe the proper relations and courtesies with all the members of this great organization. So that in this matter of personal contact it will be our aim to work out such a system as will fully take into account the authority and functions of the different classes of officers, from the presidents of colleges and deans and directors of extension work down along the line; and we shall always welcome suggestions with reference to our work in this way, and criticisms that are definite with reference to anything that may be done by any particular agent of the Department, or any frank and open discussion with individuals or through this Association or in any way by which we can secure the most cordial relations between our agents and organizations, and the agents and organization of the state institutions.

THE CHAIRMAN. The section will now listen to the report of the committee on extension organization and policy.

The report of the committee on extension organization and policy was there read, and after a full discussion and amendment in some particulars, was, on motion, approved by the section for submission to the general session.

A nominating committee consisting of W. D. Hurd of Massachusetts, A. C. Cooley of New Mexico and C. O. Ousley of Texas was appointed by the chair.

On motion, a recess was taken until Thursday afternoon, August 12 at 2 P. M.

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Afternoon Session, Thursday, August 12, 1915

Joint Session with American Association of Farm Institute Workers

The joint session was called to order by the chairman of the extension section at 2 P. M.

The Chairman. We are honored in having the members of the American Association of Farm Institute Workers meet with us at this session.

The first paper will discuss the subject "Shall Extension Service Include the Social, Recreational and Educational Improvement of Rural and Urban Districts?" It will be presented by Director W. D. Hurd of Massachusetts.

Shall Extension Service Include the Social, Recreational and Educational Improvement of Rural and Urban Districts?

By W. D. Hurd

The subject as given on the program is not of my own selection. I know of no reason why the program committee should have chosen me to discuss this question except that our college has gone farther, perhaps, than most others in the field of economics and sociology, both in college teaching and in our extension work.

The way in which the subject of this paper is stated on the program seems to imply that there may be doubt in the minds of some people as to how far these state-supported educational institutions should go in giving instruction in the economic, social, educational and recreational fields. It also offers the opportunity, if one chooses to follow it, of discussing the subject in an argumentative way.

Nowhere in this paper have I taken the stand that all the work here discussed should be delegated to the colleges alone. It is my best judgment that every agency engaged in rural work should realize the need of better organization in the field of economics and sociology and should do all it can to develop further these relatively neglected phases of our country's most important problems. There should be no conflict between men representing the several agencies. The subject as stated, however, raises the question whether or not the colleges shall or shall not enter into the field mentioned; and I shall confine my paper strictly to this subject.

In my preparation of this paper I have taken the time to review rather carefully the Proceedings of this Association, those of the American Association of Farmers' Institute Workers, and such papers as are available from the National Association of State Universities for several years past. I have had at hand, also, about twenty-five letters bearing on this subject received from men engaged in the development of extension work in state colleges, and have had access to about fifteen letters, gathered for another purpose by President Butterfield, from leading educators and captains of industry who have been associated closely with and intensely interested in developing the agricultural industry. Using this and other material, I desire to present evidence tending to show that from the following different points of view, it is not only legitimate, but that it is a duty not to be cast aside lightly, for these public supported institutions to enter the fields suggested by this subject.

First. From the general needs and tendencies of the times.

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Second. From the original intent and later interpretation of the Morrill Land-Grant Act.

Third. From the policy as followed from the outset by this Association.

Fourth. From the point of view of leading educators, including those within and those without our own membership, as well as of captains of industry.

Fifth. From the standpoint of those actually engaged in this work, and from the policy of some of our leading institutions.

You will notice, moreover, that the word "educational" appears in the subject. I believe we may dismiss that part of the subject which relates to "educational" work by declaring that true extension work is educational work—teaching, if you please; if it is not this, then it is nothing. The time has passed when mere propaganda work and clever forms of advertising find a place in properly organized extension work, and, so to speak, can "get by"; and I know of few instances where any semblance of these things has even the remotest connection with the extension service organization.

1. GENERAL NEEDS AND TENDENCIES

The most optimistic will admit that we have not attained all that might be desired in our rural life. After fifty years of work by the colleges, the experiment stations, the boards of agriculture, the grange and other farmers' organizations, and the agricultural press, we find ourselves face to face with the fact that the average acre production of our great staple crops has not increased during that period, that we have sections in the East of run down land and depopulated towns, that throughout the Middle West fertility is lower than it was twenty-five years ago, instead of higher, that farm buildings are growing poorer, that even in the richest farming counties of the Mississippi valley the exodus of prosperous farmers to the county seat towns still goes on, with the resulting opposition on their part to educational and civic movements, that farmers still continue to receive only about one-third of the consumer's dollar for their crops and produce, and that social discontent still exists on the part of young people in rural districts. All this, too, in the face of the most marvelous industrial development any country has yet known, and the development of such markets for farm produce as never before have been realized in this country.

We recognize that conditions are not right. Is the trouble organic, or is it due to a too rapid development and expansion before readjustments can be made? Our colleges in the past have devoted practically all of their instruction to problems of production. No longer ago than the time I was in college, there were few courses in economics, sociology, marketing, community organization, or kindred subjects which were related to the rural field. Political economy in those days consisted of memorizing a good share of a very large text book.

If the methods used in the past by our colleges and other agencies interested in agricultural development have been sufficient, why the Roosevelt Country Life Commission, the large commission which visited foreign countries in 1913, the strong and statesmanlike utterances of Secretary Houston on rural organization, and the immense amount of propaganda work being done by the United States Department of Agriculture, the multitude of legislative enactments, both federal and state, endeavoring to solve problems relating to the farmer's business, his health, and his happiness?

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About two weeks ago I listened to a highly entertaining and instructive lecture by Dr. Hugh Cabot of Harvard University on the subject of "Social Hygiene". Treated as this subject was in its broadest relationships, it impressed me that, since this term embraced the business, educational, social, economic, physical, mental and moral health of society, what we needed in our rural society was a good dose of this "social hygiene" as prescribed by Dr. Cabot.

We have come to realize the economic crisis which we are facing. We hope it is only a temporary crisis. However, not only should our extension services, but every other agency interested in rural development should pause, take careful account of the load to be carried in the future, and seek so to organize and combine their efforts that the whole field, all the aspects necessary to the welfare and happiness of our rural people, shall receive due attention.

2. THE ORIGINAL INTENT AND LATER INTERPRETATION OF THE MORRILL LAND-GRANT ACT

It seems clear that when this law was framed and the phrase "providing a liberal and practical education for the industrial classes in the several pursuits and professions of life" was included, that both Mr. Lincoln and Mr. Morrill intended that the field now included in agricultural economics and rural sociology should be covered. Little need be said at this time in this connection. The congressional records, the deliberation of state legislatures during the past forty years, statements of the earlier members of this Association who knew the drafters of the Morrill Act personally, and who received from the lips of Mr. Morrill his own construction of the service these colleges were to render, all testify to the fact that the considerations mentioned in the title of this paper should secure their proper share of attention at the hands of agricultural college administrations.

The consistent trend of the present Convention as shown in the welcoming address of President Wheeler (pages 19-20), and in the address of Dean Hunt (pages 83-90), and of President Duniway (pages 94-96), emphasizes the social and economic sides of our rural life. Surely it is inconsistent for one to attempt to argue that an educational institution should not teach beyond campus bounds those subjects which are taught within them, provided it has the force and funds to carry on such work.

It is not easy to interest farmers generally in social and recreational matters. They call for help primarily along productive lines. However, it has been found in Massachusetts that when these matters are presented properly, great interest is shown and our help is freely sought.

3. PUBLISHED RECORDS OF THIS ASSOCIATION

Judging by the support which this Association has given to national legislation, to institutions and to individuals in time of stress and trouble over policies to be followed, only one inference can be drawn, and that is that this Association as a body believes that these colleges should do research work, teaching and extension, in the fields of economics, sociology, and general, welfare. Statement after statement may be found in presidential addresses, item after item in the reports of the several committees dealing with college organization and policy, station organization and policy, and extension organization and policy.

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Extended comment on what is official record seems unnecessary. However, I may be permitted to quote the statements of two of our former members who, I think, always were rated in the conservative class:

The late President Buckham, in his presidential address delivered at Baton Rouge in 1896, said:

"Let us distinctly understand that interested as we are with the education of a large portion of our people in 'the several pursuits and professions of life' it is our business to educate them in those liberal arts which make for the broadening and sweetening of life." Certainly our rural people are entitled to all these "broadening and sweetening" influences that we can give them.

The late Dr. Voorhees, in his presidential address, at Washington in 1905, after discussing the social and economic phases of rural life at some length, said:

"The agricultural colleges must recognize the gravity of these problems and give them not only moral support, but should be the leaders in solving them."

And in the Twenty-second Proceedings (Washington, 1908, pages 38, 39) I find the following statement made by the standing committee on extension work:

"We desire to record our belief that extension teaching should at the beginning be put on the broadest basis, and that in the work of the extension departments of the agricultural colleges should be recognized the economic and social phases of agriculture and also that great untouched field for educational work—home life on the farm."

4. OPINIONS OF LEADING EDUCATORS AND CAPTAINS OF INDUSTRY

The following quotations are taken more or less at random from letters sent to President Butterfield. Some letters were of a confidential nature and of course are not used here. These expressions of opinion reflect pretty fairly their general trend. The letters were written in answer to the following questions asked by President Butterfield:

"Do we apparently over-emphasize the economic and social aspects of the rural problem?

"Is it legitimate for a state-supported agricultural college to engage in research, teaching and extension service in this economic and social field? What are the legitimate limitations to such work?

"Are there other institutions or organizations that can better do this work, and that really ought to do it?

"Is there any reason why the college should not participate in a general movement for effecting rural organization, so long as it confines its efforts to educational and advisory work?"

I do not attempt to quote exactly or completely. You will note, too, that two of the answers are rather negative as to the questions at issue; but they represent the opinions of leading railroad men of the East and the West respectively.

Mr. James J. Hill says:

"After thirty years of experience in trying to help farmers I am constantly impressed with the idea that the only real help to the farmer is all such information and assistance as will enable him to get the best results from the cultivation of his own land with his own hands. * * * * Really when we come to the last analysis, what the farmer can be taught to do with his own hands on his own land is about all that can be done for him.

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The question of his social uplift and others of that nature will amount to very little for the farmer if his work does not bring him a return in money value. It seems to me that the first step is to enable him to get more value out of the ground for the labor he puts in."

Another railroad man, Mr. W. C. Brown, says:

"I am thoroughly in favor of everything contained in the first three groups. * * * * I am, however, very much in doubt as to most of the subject referred to in group four which may be termed the refinements of the rural problem. * * * * I am satisfied that for the present and for some time to come, any attempt to push forward the work suggested in group four would provoke such opposition and prejudice as seriously to embarrass and hamper the practical and exceedingly important work embraced in the first three groups. * * * * I watched the effect of the work done by the Commission appointed by President Roosevelt, of which my friend, Prof. Liberty H. Bailey, was chairman, and I was fully satisfied that the work of that Commission was of comparatively little practical value."

Mr. Seth Low says:

"It is legitimate for a state-supported college to engage in teaching, research, and extension work in the economic and social field. * * * No other institution or organisation can do the work better, and that really ought to do it."

Mr. H. W. Collingwood (Editor, Rural New Yorker) says:

"Much should be done in our system of agricultural education on the business side. * * * * Colleges do not over-emphasize the economic and social side—do not go far enough—for these are the overpowering topics which ought to be made much of." He says further "What else were agricultural colleges established for if not to help farmers along these lines? If we say that the colleges are simply to educate farmers and show them how to produce larger crops, we leave the farmers more at the mercy of other industries than ever before."

Mr. Collingwood thinks that these things could be carried so far as to do violent injury to some lines of business, and further says:

"If the colleges stand back and let other institutions not well prepared carry this through, I think the colleges will lose caste and character and farmers will think that these institutions have not done their full duty."

Dr. Charles W. Eliot says:

"A few of them are controversial or have political bearings and may therefore have to be cautiously treated, but they all seem to me to be urgent questions that an intelligent farming class ought to hear discussed both at the college and in the college's extension service. Naturally the courses which relate to the increase of farm production are more fundamental and should be first provided for, but the others have nevertheless an intense interest not only for the farming class but for the future commonwealth."

Dr. T. N. Carver does not think colleges have given over-emphasis to the subjects indicated. He thinks it legitimate to teach and do extension work on these lines. The only limitation he would urge would be to require the college to confine itself to the educational aspects rather than to engage in propaganda or control work.

Secretary Houston considers that the special and economic aspects of rural life deserve more attention than they have had in the past. He recognizes that the rural problem is something more than technical farming or a matter of increasing the net farm income. He says that "it is not only legitimate to engage in work along broader, social and economic lines, but it

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is clearly the duty of every agricultural college to do so." Secretary Houston further believes that "the agricultural college cannot fulfill its mission in useful training for rural life unless it aims to develop a leadership competent to approach various problems of community life in the country."

Dr. A. C. True believes that the time has come when the agricultural colleges should broaden their work to cover agricultural economics and sociology, but says that some phases of agricultural economics and sociology are so closely related to business, political or religious matters that the college should not touch them.

A. C. Monahan does not believe that the college has given enough attention to these problems in the past.

Director Alva Agee "believes all three lines of work mentioned have a rightful place in the extension service of a land-grant college".

Dean H. L. Russell holds that the economic and social side of the work has been grossly neglected in the past. He believes that state-supported institutions should see to it that teaching, research and extension service is extended to the economic and social field, and that within certain limitations such work is at once legitimate and highly desirable.

Dean Eugene Davenport feels that colleges do not over-emphasize these matters at present; that such work is quite legitimate; that no other institution is in position to render this service. He regards sociology and economics not different in theory from chemistry, physics or botany, where the facts have a bearing on the development of agriculture and the welfare of the people. He further says that "indeed, if any one field in agriculture can assert a special claim upon the institution, it is the field of economics, because in the last analysis not only the food production but the lives of farmers and of all others is very largely an economic problem."

Dr. L. H. Bailey feels "that it is the privilege and the opportunity of the agricultural college to engage in research, extension teaching and other enterprises touching the economic, social, educational and religious sides of rural life. There are no other institutions that can handle this subject as effectively, although I would not take the position of trying to hold this field exclusively for the colleges of agriculture."

Dr. K. L. Butterfield believes that extension work on these lines should be carried on "because it is the business of the state college through its extension service to help rural people solve all of their problems. This duty lies with the college not merely because of the interests of the rural people but primarily in the interests of the State itself. It is vital that the life of the people and the development of their communities should be assisted, because in the last analysis the interests of the State require the best possible communities. * * * * The farmer is of more importance than the farm and should first be improved. * * * * In the long run the quality of the people on the land will determine the quality of the farming as well as the quality of the contribution which the farmers make to national civilization."

5. POLICY OF THE INSTITUTIONS

That our agricultural colleges believe in the advisability of carrying on extension work in the field of rural sociology and economics, is best shown by the practices of several of our leading institutions. Only a few of the more significant efforts in this field have been selected. No attempt has been made to secure a complete report from all the colleges.

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California. Assists in town planning; organizes country and rural improvement clubs for the betterment of social, recreational and sanitary conditions, "those elements which go towards making the country a more livable place for human beings."

Illinois. Has a corps of five or six men dealing with civic improvement and town planning work; employs a community adviser who does work along social, religious and business lines.

Iowa. Does work along civic improvement lines; emphasizes the desirability of community organization, especially along social and educational lines; organizes cooperative societies for the purchase and sale of agricultural commodities; enjoys the hearty cooperation of nearly every commercial club and organization in this work.

Kansas. Assists in play-ground work; establishes welfare and social centers; encourages community music and lecture and loan bureaus; hopes to establish a marketing bureau in the near future. Incidentally, by securing the names of farmers in other states who needed certain things, has "unintentionally" encouraged business by selling more than 1300 cars of apples and 1600 cars of alfalfa, believing that "it is as much within the province of a college to help a man market his crop as to raise the crop, as desirable to help him ship his apples as to spray his fruit."

Minnesota. Does much work in civic improvement; surveys towns and indicates the lines of their future development.

Missouri. Develops community spirit by organising farmers, boys, girls, and women; attempts to improve social, economic and intellectual conditions.

New York. Has a committee at work developing a plan for inaugurating extension work in rural sociology and economics.

Oregon. Does some work along civic improvement lines; assists in and encourages community organization; does work looking toward the opening of school houses as social centers; has just opened a bureau of markets; believes that "successful work in agricultural practice can only be done when communities are properly organized and alive to matters of individual and community betterment."

Pennsylvania. Is encouraging farmers' business organization in connection with county agent work; believes that civic improvement and community organization work are legitimate.

West Virginia. Has encouraged farm bureau committees to work along lines of education, sanitation, cooperative buying and selling organizations, etc.

Wisconsin. In addition to the widely varied work carried on through the university extension system proper, furnishes plans for school grounds; assists in community organization; helps form associations of potato growers, alfalfa growers, livestock breeders, etc.

In view of the fact that Massachusetts perhaps has done much in the extension field in rural economics, sociology and recreation, it may not be amiss for me to set forth our point of view and what we have been attempting to do. We believe that as soon as funds will permit, our extension work should touch every point in our rural life where the college may be of service. We do not ignore nor do we slight the problems of farm production and farm management, for we have more people engaged in this work than in the economic and social field; yet we lay a good deal of stress on the importance of these latter lines of work.

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We seek to promote town planning, civic betterment, home, school, village street, and country road decoration. We encourage social and business co-operation between rural peoples and communities. We conduct extension schools of community development as well as along technical lines wherein problems of community organization, school affairs, health, morals, town administration, taxation, home affairs, etc., are discussed.

We have sent a woman trained in home economics into a community for a period of three months, where she has lived with and advised the women along household management lines in the same way that a farm management demonstrator advises the farmer as to the reorganization and development of his farm business.

We have a community adviser who goes, when asked, into a community, studies conditions, meets with the residents, calls in assistance from any available organization on any topic, and helps direct the attention of these communities along the lines which will follow long term policies of progress.

We hold an annual conference on rural organisation. The program is made up jointly by the college and by eleven other state agencies interested in the development of the social and economic aspects of rural life. The broadest kind of a program is presented, covering education, civics, sanitation, club work, library work, farm bureau work, recreation, including even church topics.

County and local agents are adopting state-wide plans for better rural organization to the conditions in a multitude of communities. We are attempting to overcome the strong individualistic tendencies of more than thirty organizations which lead them to work separately, urging them to join in a federated movement for the general upbuilding of the rural life of our Commonwealth. Our latest venture in this line is an attempt to form a Massachusetts Development Commission, which we hope will be the clearing house of a large amount of prospective legislative material and the formulator of broad gauged state policies, which will be adopted and prosecuted by local organizations all over Massachusetts.

We do not feel when thus engaged that we are transgressing or are working outside our legitimate sphere. We do not pretend to do all the work alone, but try to secure the cooperation of every agency properly interested in this phase of our work, urging it to do its part to the general end of upbuildiing the countryside. One thing, however, is clearly evident, namely that in those communities where the work of community organization has been most earnestly prosecuted there is more economic prosperity, more social intercourse, better schools, better roads, better town administration, more helpful and active religious life and more real contentment than obtains in those communities which have been interested simply in their material advancement.

About the only objection I have heard raised against the proposition that the agricultural colleges should enter upon extension work of this character are to the effect that educational institutions should not interfere with commercial organizations, should not enter upon the field of the country church and should not do work which ordinarily is done by certain classes of professional men. The objectors appear to hold that while it is quite legitimate for the college to advise the farmer how to raise more corn and hogs, it oversteps when it seeks to assist him in the sale of his corn and hogs, in beautifying his surroundings or in providing those things which are necessary to human welfare and tend to augment the contentment and joy of farm life in the open country.

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Instead of the great movement cityward of a generation or two ago, we find ourselves in the midst of a decided movement countrywards. What shall these people, unused in many cases to country ways and country living, find there? The college is the most stable and competent institution to help them in providing a system of rural organization and social life which is adequate and satisfying.

Most of us have passed through several periods during which it was expected that newly born agencies would accomplish the whole task. First it was the college, then it was the grange, then the farmers' institutes, then the experiment station, then the consolidated school, then some other farmers' organization, then it was the extension work of the college. Now it is the county agent movement that is being looked to as the great "saviour" of the agricultural industry. In most cases the first flush of enthusiasm has died away. No one of them singly has had the vision of what the great problem is or has proven able to cope with it successfully.

As the Hon. C. C. James, Provincial Minister of Agriculture, well said in an address made before the American Association of Farm Institute Workers in 1904, "If we can only get that aspect of the question clear in our minds—that in this great agricultural movement we are not simply working to build up men's dollars, that we are not simply working to make our country wealthier than some other country, but at the same time by means of this work we are helping to build up a citizenship — we are helping to build up a class of people, a yeomanry if you wish to call them that, a great class of people who will be the backbone of that community, who will add to that community those great moral forces which are so important in forming great public opinion."

The demand for a "redirected rural life" in this country is insistent. Many feel that they cannot wait for the agricultural colleges to graduate men to act as leaders and that men of the right type must be found and found promptly to direct these new movements within the communities. There is much force to this point of view. It certainly appears to be an important part of the work of our extension services to discover and develop these men. We face today as never before the necessity of solving the whole problem of rural organization; and the colleges must participate in its solution. They cannot shirk their duty, their opportunity, their privilege, their task. As I see it it is the duty of the colleges, without slighting their research work or their resident teaching, to develop through properly organized extension channels such a body of knowledge in each farming community as will tend to promote larger crop growth, a more intimate knowledge of the use of fertilizers, a more adequate system of soil fertility maintenance, an improved system of farm management, the use of better seed and better livestock, improved methods of marketing and of communication, better roads, better social organizations, economic systems, credit facilities, schools, churches, town administration, sanitary and recreational features; in short, better community organization in matters material, economic, sociological, better team work, less individual work.

If interest in all of these things is to be aroused, if systematic instruction is to be given, if leadership is to be furnished and directed, the agricultural colleges must do much of this work. They are logically a unit. They are bound together historically by ties of state and federal financial support and by traditions covering more than fifty years of steady progress. They are guided by men of similar and quite uniform training, preparation and high educational ideals. They were created by act of the people, supported by all

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of the people, and are looked to by all the people for help, guidance and leadership in rural community affairs.

A DELEGATE. How can extension service work be conducted in the city? We have problems there.

W. D. HURD. There are many rural communities centering around small villages and cities in Massachusetts. Some of our most successful work is carried on in the larger cities. In one city there is a boys' and girls' club of 7850. The strong Young Men's Christian Associations in large cities are eager for our lectures. This year we conducted a course of 26 lectures at one association. We had several requests for some form of extension work in Boston and, finally, the Boston Chamber of Commerce took up the matter. Last year, working in cooperation with the chamber, we gave a course of 45 lectures in Boston, attended mostly by suburban people. Through these activities we are reaching many people.

C. OUSLEY of Texas. Do these sociological and recreational activities for rural betterment come within the scope of the Smith-Lever Act? I thoroughly believe that this great work for rural welfare should be done. Where an extension service has independent funds and the situation is as inviting as it is in Massachusetts, it can enter freely upon such a campaign; but the situation is changed where institutions are operating exclusively upon the Smith-Lever funds and the corresponding state quota, all of which really constitutes one fund, the expenditure of which by terms of the federal act is confined to work in connection with agriculture and home economics. Now marketing is agriculture as much as production is agriculture; but is recreation agriculture, are rural schools agriculture? Has any interpretation by competent authority been secured as to this matter?

W. D. HURD. We have not raised this question for the reason that this work has been carried on with state funds which are not hedged about with restrictions. We have about $38,000 not involved directly or indirectly with the Smith-Lever funds. We use no Smith-Lever money in our marketing, sociological or recreational work.

C. B. SMITH of Washington, D. C. I think that it is very possible to frame projects dealing with marketing, using the Smith-Lever funds. The question as to the validity of work along sociological and recreational lines has not as yet been presented for consideration, and I should not care to give an offhand judgment.

THE CHAIRMAN. "Extension Work in Home Economics" will be discussed by the representatives of two federal departments. The first paper has to do with the subject of "Organization and Methods", and will be read by Mrs. H. W. Calvin, Specialist in Home Economics of the Federal Bureau of Education.

ORGANIZATION AND METHODS IN HOME ECONOMIES EXTENSION

BY MRS. H. W. CALVIN

Extension service in home economies must of necessary be organized in the same general manner as that which is decided upon for the similar service in agriculture.

Under the Federal Department of Agriculture through the station Relation Service and by the direct authority of the president of the land-grant college, this service in home economies is made possible. Home economies teaching within as well as without the colleges, long has been the sister to agricultural instrtction. Following the same general paths, lagging a little

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behind and often stumbling at times, questioning if two must needs journey over the same route, home economics teaching has not ventured very far afield.

Instruction in home economics is needed quite as badly by the townswoman as by her country sister. Often the wife of the shop worker, the store clerk, or the day laborer, is more handicapped because of the lack of this fundamental knowledge than is the farm woman. Hence the extension service in home economics needs organization along broader lines than does that of agriculture.

COLLEGE ORGANIZATION

Within the college two general types of extension organization are prevalent and many modifications of these two are possible. In one of these there is a staff of home economics instructors responsible only to the president of the college and to the director of extension. In the second form of organization the home economics teachers in extension are a definite portion of the home economics department. They rank as assistants, instructors or assistant professors with the privileges and responsibilities that would be theirs were they teaching on the college campus only.

In this latter form of organization the extension teacher is responsible to the college president, the extension director, and also to the head of the home economics department. She is nominated by the head of the home economics in conference with the director of extension and is appointed by the president.

There is something very tempting about the simpler organization, i. e., that in which the director of extension chooses his subordinates and directs them. The extension teachers plan their work, advocate their theories, reach the parents of the college students and reach the school children who are to be college students, yet are not hindered by customs or traditions of the institution from which they go. When in the field, they are stimulated by the response of sympathetic audiences, when on the campus they are uninterrupted by students or local influences. The fact that the director of extension is a man and admittedly ignorant of home economics conditions gives the woman working in that subject far more liberty than the men in agricultural lines can dream of having. The director himself finds it easier to deal with those who are directly in his employment and who are answerable to him alone. There is less likelihood of differences of opinion when those in conference hold their position by his authority alone. Furthermore when all members of the extension directors' staff are officered together, interchange of material is much more easily affected. Viewed from the extension director's position and that of the active home economics lecturer, this form of organization appears far simpler than any other possible one.

Before a decision can be made as to the best type of organization, certain fundamental principles must be established. An organization must be secured that makes for permanency of effort. Teachers of home economics marry and directors of extension resign, yet the extension service must continue uninterrupted and must progress along definite lines.

Can any educational institution maintain advantageously two departments for the teaching of one group of subjects? How long may there be reasonable expectation that the instruction within the institution and that given without its walls will follow similar lines if separately administered? Since the percentage of human faults among college people probably is not much less than that which exists elsewhere, does not the first type of organization

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offer opportunities for innumerable differences of opinions and petty jealousies? Ranking, salaries, vacation periods, popularity within the state, all give cause for discontent and friction.

When all the subject matter of home economics instruction, both that which is given on the college campus and that which is carried out into the State, emanates from one department, will not uniformity result? The mother at the extension school, the daughter at the college, and the little sister in the school club, all receive the same general information. There are no conflicts of theories or of practice, but where contradictory statements are made by representatives of an institution, the institution itself is discredited among the patrons.

Where the home economics section of the extension service is separate from the home economics department of the college, interchange of effort is difficult. Where the field workers are an integral part of the general home economics division, adjustments to the needs of the different lines of work are made easily.

Few of the states have sufficient funds to employ a large number of specialists for home economics extension, but by close cooperation with the regular instructional corps of the school the woman most fitted to meet the particular needs of any certain community can be detailed for extension service and, if necessary, the usual field worker can be placed in charge of college classes during her absence.

The flexibility thus attained is of inestimable advantage. The extension teacher learns the institutional organization by replacing occasionally one of the regular instructors, while the classroom teacher becomes acquainted with student home conditions and acquires a knowledge of state affairs with which she might remain unfamiliar for years if her efforts never extended beyond the campus gates.

One fault prevalent in educational institutions is that there is a lack of preparation for future development. The immediate publicity, the spectacular result, the personal laudation are tempting, and may menace the lasting success of extension service. That form of organization should be maintained which will afford the safest foundation for future development, assure the promulgation of the soundest theories and secure the greatest degree of continuity of effort in spite of the changing personnel of the staff of instructors. There is no question in the mind of the speaker but that these desirable conditions can be attained if the director of extension and the head of the home economics division are cooperatively in control of the extension service; the director to handle the financial matters, plan for state tours, care for advertising and local matters, the head of home economics to have entire responsibility for the type of instruction given and the adaptability of the lecturer to the particular locality. The extension director should have charge of the publication and distribution of material, but the head of home economics division should be responsible for the subject matter and its manner of preparation. Definite projects extending through several years should be planned and matured carefully.

A heavy correspondence with the women of the state is one of the natural results of successful extension teaching. All this correspondence should be handled in the central office of the home economics department and from that be referred to the instructors best prepared to reply to the inquiries made. This method not only secures more satisfactory information for the inquirer but distributes the burden of the correspondence and insures the sending of immediate replies. All answers to inquiries should be read and,

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if necessary, edited by one responsible person before being sent from the department.

DEPARTMENTAL ORGANIZATION

Extension teaching, college teaching, and work of an investigational nature, all must be done in the home economics departments and knowledge relating to all three divisions should be common to all, that the extension teacher may carry the best and newest information to the women of the state, that the teachers within the institution may know the needs of the state and that the investigators may rightly judge of the value of any particular experiments initiated. The organization within the home economics department will include teachers whose duties primarily are in the extension field and others whose principal responsibilities are discharged upon the college campus. Since the extension teachers are paid out of separate funds, it is but just either that their entire time be given to extension service or that an equivalent service be performed by other members of the home economics faculty. The extension teachers should receive the same rank and salary as those performing an equivalent service upon the campus. Where funds permit, specialists should be employed in the various phases of work undertaken.

COOPERATIVE ORGANIZATION WITH OTHER THAN COLLEGE FORCES

An organization should be established which will make possible the use of the great numbers of high school teachers of home economics. They are at the foci of needed work, they have the information required for efficient teaching, they themselves need the broadened viewpoint which results from extension service. It remains only for extension authorities to recognize the possibilities of organizing and directing the high school teachers. Many young women now are teaching Saturday and night classes and are eager for guidance and encouragement. Often they would extend their efforts willingly into the nearby country; yet there are cases where this effort by the local teacher is discountenanced by the extension director. Is it not well to use all the tools available and so organize that all efforts may tend in the same general direction?

Manifestly it is possible to use local teachers of home economics twelve months instead of nine with but slight increase of expense. It remains for extension authorities to mature a policy which will hold these teachers in their community for the entire year and make them of value to adult population as well as to the youth enrolled in regular schools.

A reasonable question which may arise in the mind of the directors of extension is one relating to the fitness of the secondary teacher for extension service. It must be admitted that heretofore their preparation has not been such that they are inclined to or ready for this work, but it is reasonably certain that little time or effort would be required to give to them this preparation. The regularly employed extension teacher could be detailed to certain local centers and thus give the needed instruction.

Women teaching in village high schools easily could meet country classes Saturday afternoons or organize a town class for country women Saturday mornings, using the noon lunch as the central idea. In small states where there is dense population and an abundance of money, it may be possible to reach all women by sending out regular college employees, but in large states where travel is expensive, a greater use should be made of the adequately prepared

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local teacher. The high school teacher is not receiving the recognition she deserves.

EXTENSION METHODS

The first significant movement for carrying definite information to the mature rural man and woman was that of the farmers' institute. This took the form of one-, two-or three-day meetings. These meetings were supplied from the college with one or two trained teachers and the program was completed by arranging for talks by successful farmers of the locality. Subjects of interest to the rural woman appeared upon the program and separate meetings for the women were arranged. The genuine success of the farmers' institute led to all the later phases of extension work.s. The extension school, the short course, the correspondence course, and the formation of rural clubs are but the natural evolution of the ideas which led to the establishment of the farmers' institute. A new generation is ready for instruction and guidance, more money is available, workers are better prepared and as a result certain kinds of instruction are possible now that were not to be thought of a few years ago.

The farmers' institute has been a source of inspiration and a creator of intelligent interest in better methods of rural life and practice. Its service still is needed. It should be followed by more prolonged and detailed instruction in scientific theories and methods. The itinerant schools located in the center of population have served useful purposes, yet has the small neighborhood been reached and have the individual problems of the country woman been solved? It is far more expensive to go often to a few than to go a few times to many and the results do not show well in annual reports; but it seems reasonable to conclude that the line of advancement in home economics extension teaching will be in the direction of individual instruction or in small group teaching.

Organized woman's clubs are eager for direction in the study of home problems. Granges, farmers' unions and other rural organizations need and desire guidance in their studies for rural home betterment. The opportunity awaits the home economics departments for assuming this responsibility and furnishing the service so much needed and desired.

A FEW EXPERIMENTS IN NEW METHODS

In Delaware four small ventures were made this year in meetings for a few women. The extension teacher went each alternate afternoon for six weeks and had classes of about 20 women. Informal discussion followed the lectures and demonstrations, and books on home economics subjects were taken home for study. Two small communities rather close together were chosen and the instructor spent her mornings visiting. In six weeks one woman became well acquainted in about fifty homes.

A teacher in home economics in West Virginia tells of her work as follows:

"Early in the fall term I succeeded in finding three groups of women who were interested in the work I wish to give them. Two of the groups were at points so situated that they could be visited on the same day, thus making it possible for me to meet a group at one point at ten in the morning and at the other point at two in the afternoon. I visited these points every two weeks, going to the third point on the intervening Friday. For the spring term two new points have been selected and work is given there every Thursday afternoon and every Friday of each week.

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"At one of the points visited during the fall and winter terms, the club met on the Fridays intervening between my visits to them. They emphasized the social side then and discussed various topics. A few I now recall are: 'Some places where one could buy cheapest,' 'An exchange of ideas in Christmas giftmaking.' One day all had their knitting or crocheting and those who did not know how were supposed to learn that day. On another day, each woman had to tell how she used up left-over material, and I suppose my work came in for its share of discussion. On these days light refreshments were served by the lady entertaining.

"To meet the women in their homes makes the work very informal, and I felt I got better acquainted with the women in this way. Then, too, it meets a social need in the rural community which cannot be found in the hall or public school building."

Since this paper is to be followed by one emphasizing extension methods, it has been deemed desirable to confine this discussion to types of organization.

SUMMARY OF RECOMMENDATIONS

1. Center in the institution responsibility and authority for material and presentation in the organized home economics department.

2. Insure cooperation between the home economics division and the extension division in order that the women most needing information may receive aid and that the general plans of the extension division may be carried out with efficiency.

3. Organize the home economics division in such a manner that the most suitable instructor may be detailed to extension service and that free interchange of information and interests may be maintained in the department.

4. Use all prepared teachers whenever possible and insure the cooperation of clubs, granges and other local organizations.

5. Plan for future growth and let all instruction given be of such a nature that it becomes a basis for further and continued instruction.

Another phase of organization should be mentioned and that is the interstate organization of extension work. Why should we be divided by imaginary lines? Why should not people be sharing each others materials? Perhaps the States Relations Service may help in the matter. We have printed certain types of material; and yet it is not material that is the result of inspiration. It is just popular material, which is good and yet might be issued to advantage for several states at a time. We might interchange our literature occasionally with benefit to the work and to the instructors. Certainly we have reached a time when we do not any longer fear the growth of a sister institution, but rather have reached the stage where we all have a common interest.

A. J. MEYER of Missouri. Referring to the statement that our home economics extension work should be as freely available to town as to country women, the question arises whether, in the light of the distribution of Smith-Lever funds on the basis of rural population, the framers of that act did not have it in mind that this work was specifically for the benefit of rural people. The act itself is silent on this point. The need is apparent; yet there is the indirect inference that this work is meant solely for rural people.

B. KNAPP. The States Relations Service has not as yet made any definite ruling upon that matter; but I think the general concensus of opinion is that the Smith-Lever funds were intended by Congress to be used for the benefit of rural people. It is expected that vocational education will be

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furthered through additional federal legislation, and that in this way the interests of the urban population will be safeguarded.

G. I. CHRISTIE. Is not the agricultural college supported by the Government for all the people? Can we afford to allow the Smith-Lever Act to narrow the activities of the extension service to communities of 2500 or less? Of course Smith-Lever funds are being spent to advantage in such places; yet nevertheless extension activities ought to reach the larger places. If we do not now have the money to do this, we must get it.

E. G. PETERSON of Utah. Clearly the question is one of expediency. However, the land-grant colleges deal with many subjects other than agriculture. Their field is rural civilization and the development of the open country is a critical national issue. The time will come when they will carry their message to the towns and to the city, for their need of the work is just as urgent as that of the open country.

K. L. HATCH of Wisconsin. The Smith-Lever Act provides for instruction and demonstration in agriculture and home economics. Shortly after the bill was passed, a circular was issued from the Federal Department stating in effect that it was expected that the instruction would take largely, perhaps 75 percent, the form of demonstration work. It has been comparatively easy to frame our demonstration projects in agriculture. We are not clear how to shape our demonstrations in home economics.

THE CHAIRMAN. The second paper deals with the subject "Home Demonstration", and will be presented by Miss Mary E. Creswell, Assistant in Home Demonstration Work, States Relations Service of the United States Department of Agriculture, Washington, D. C.

HOME DEMONSTRATIONS

BY MISS MARY E. CRESWELL

In the home demonstration work as now conducted under the cooperative relationship of the United States Department of Agriculture and the state colleges of agriculture of the South, there are 400 women agents whose time and thought are devoted wholly to the interests of women and girls in farm homes. The activities directed by these women represent a type of education but recently recognized, yet of such usefulness that it has become a part of the life of more than 50,000 Southern homes, has been accorded a permanent place in school systems and receives recognition and aid from colleges and universities of every state.

If today we could take by some means a bird's eye view of the fifteen states where this work is in progress we would find most of these agents, say 75 percent of them, abroad in the open country, traveling by divers means through their counties, some in their own automobiles or buggies, some by invitation in conveyances of farmers, or some on horseback or on foot in mountain regions where travel otherwise is impossible. It is significant that these workers today are moving because the results of their work show not in their own activities but in the demonstrations which they inspire and direct in homes. To understand these it is necessary to retrace briefly the steps by which the county agent gained a welcome place as advisor and helper in the most progressive as well as in the most obscure homes.

The work was begun with girls in activities which are objective and give indirect approach to home problems. As first developed, the girls' club work was founded upon such fundamental activities as gardening, prepara-

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tion of vegetables for food and canning which still hold the same place in the scheme of work. During 1910 girls' canning clubs were organized in one South Carolina county and in two Virginia counties. These girls cultivated tenth-acre plots of tomatoes, following some simple instructions furnished by the Office of Farm Demonstration Work, and canning their vegetables under the instruction of one of its representatives. The results of this experiment were made the basis during the next year of the organization of from two to four counties each in six states under the leadership of women who were appointed to take charge of each state with the aid of a few county workers. In 1912, the states with workers in charge were increased to eleven and a total of 160 counties were organized. In 1914 there were 33,173 girls enrolled in the canning clubs of the fifteen Southern states. Of these club members 7,793 put up 6,091,237 pounds of tomatoes and other vegetables from their tenth-acre gardens. These products were put into 1,918,024 cans, jars and other containers. They are estimated to be worth $284,-880.81 and nearly $200,000 of this is profit. The average profit per member was $23.30. Furthermore these girls put up thousands of dollars' worth of other products from the farms and orchards. More than 2,000 girls also have done notable work in the poultry clubs. Many girls now are making demonstrations with winter gardens, both to secure the profit possible from them and to furnish choice green vegetables for the table. A plot of 50 feet by 20 feet on which spinach, cauliflower, lettuce and one other vegetable are raised, has been the demonstration used in many states.

In the cooperative arrangement under which the Office of Farm Demonstration Work and the several state colleges of agriculture direct this work, the policy of having a state agent, a woman well qualified for organization and supervision of the state as a unit and notably, the employment of efficient women county agents with the county as the smallest unit of organization to be dealt with by state and federal supervising agencies, has been established firmly. Usually there are men agents in the counties organized for women's work. The county agricultural and home economics agents everywhere work in close cooperation and are mutually helpful. The work of each strengthens that of the other.

The importance of the county woman agent everywhere is indicated. Successful demonstration work depends upon the existence of a leader who through personal contact with the demonstrator will give the practical information necessary to do some work so skillfully as to make it an object lesson for others who will then give inspiration to carry out the demonstration successfully, being ready always to lend sympathy and help when discouragement or failure threatens. She must have first of all the qualities of a leader and organizer. She must be well poised, sound of judgment and possessed of such enthusiasm and devotion as to inspire others to work for the cause she represents. Her knowledge of conditions and people in her county must be full and sympathetic. She must be given constant opportunity to develop skill in horticulture, poultry raising and home dairying, as well as to have gained some mastery of subjects commonly included in home economics courses.

Most states recently have added district supervising agents and specialists in home economics who will aid county agents in special ways. When movable schools are held, such subjects are given as will help the demonstrations being carried on by the county agent and supplement her work. In addition, she has definite means of following the instruction given in order that it may become common practice in the homes of her demonstrators.

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This organisation exists for the sake of the little girl and her mother who, perhaps on a remote farm, carry on the actual demonstrations and whose work is the center of the entire system. Some of the agents' duties are illustrated by the typical activities of the club member in different seasons. First she "joins the club" and agrees to do the work outlined. The agents want just such members as will make good demonstrators, and visits to the school and community are necessary. The cooperation of the teacher is essential. Probably there will be a meeting at the school for the sake of informing children and parents of the details of the plan. The teacher's aid then must be enlisted to help the girls to read and follow the first instructions for gardening. She may have a hot-bed or cold frame on the school grounds and permit plants for the garden to be raised there. Certain it is that schoolroom routine will be enlivened by the discussion necessary to help the club. Upon the agent's next visit to the community, there may be a meeting at the home of one of the girls where all the members report work done, show records to date, and receive further instructions; next a field meeting may be held on a tenth-acre plot to show how it has been prepared and to transplant some tomato plants. In each case the girl does the work, the agent guiding and directing her. One agent writes: "This week I visited a girl who lives further away than any girl I have, back in the mountains. I found her in the field hoeing, tired and very warm; but when I asked if I might see her tomatoes her pretty eyes brightened and she began to lead me over plowed ground. After we had walked nearly a mile she apologized saying that her father would not give her land so she had borrowed her ground from a neighbor for her tomatoes and other fruits. We climbed two barbed wire fences and, at the end of another half mile, Nettie smiled and said 'Isn't it pretty?' Indeed it was beautiful. Her tomatoes and plants were the largest I have ever seen. She will can them during the next two weeks as she hopes to attend school during August. Next year the girl's father will give her a choice plot and be ready to help her in other ways, because she will have made a greater profit on her tenth-acre than he did on any acre of his farm."

Midsummer brings the canning season and here again in the home of the club member having the first ripe tomatoes, the girls of the neighborhood assemble to work together, the county agent demonstrating how to take each step in the canning and the girls doing the actual work under her direction. By her next visit to this community the girls may have acquired sufficient skill to give a public demonstration in canning, at which their neighbors are taught what the girls already are expert in doing. This meeting may be held in the school grove and will have all the pleasant social features possible. Many similar "canning parties" have given happy intercourse and aroused purposeful community effort. It is the duty of the agent to develop this side of country life.

Information from recent weekly field reports of state and county agents show the scope of influence of the present work for girls. Under skillful supervision second- and third-year girls are given progressive work with selected vegetables and native fruits. From the canning of tomatoes they proceed to more difficult products. Many have succeeded with preserves, relishes, etc. Their success with special products from Southern fruits heretofore wasted is indicated by the work of one Florida county where the girls, under the direction of the county agent, put up $7,000 worth of guava products, in North Carolina where the girls and women of one county will fill an order for a carload of fig and damson preserves and scuppernong products and in the cultivation of special crops like the Spanish pimento. Nearly

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1,500 girls now are raising this pepper, which, when canned, will give from 50,000 to 100,000 cans for market in the fall of 1915. Their training in sewing is illustrated by the seventy-five girls of a Georgia county, who appeared in a parade in their club uniforms, the white caps and aprons, which each girl had made, having the club emblems neatly embroidered upon them; and also by a recent photograph of a group from two Texas counties in dresses which they had made in club work. The development of their skill in cooking is shown by the reports of demonstrations in homes and the lunches they have given their friends.

On my way to this meeting my journey was interrupted in four states for conferences with state agents. One of these agents was full of enthusiasm over the recent short course for prize-winning girls. These short courses are held annually in almost every state for the purpose of awarding honors for fine achievement and giving training in leadership to those girls from every county who have proved their efficiency by successful club work. This state agent, with a county agent went into the home of a girl who had just returned from the short course. The mother explained that her daughter was preparing the dinner. When they sat down to this meal it was noted that each dish was one she had learned to make at the short course. The menu was well planned and each dish well cooked. In another county the girls who won the scholarships were assisting the county agent in certain demonstrations given in community meetings. In many places they were their club presidents, and were directing meetings in the agent's absence.

The report of how these prize winners had spent the money earned from their gardening and canning was significant; one girl had for two successive years paid her expenses at the county high school out of her earnings. Another had helped her brother in college, another purchased a fine cow, and still another enabled her father to hold his cotton until spring by making her fund available for certain family expenses. Surely these girls are gaining business experience of value.

The girls' demonstration work has proved a finer means of introducing a system of insruction for the women in rural homes than direct work for them would have given. In the first place better results can be secured by working with young people whose habits are not crystallized, who have no preconceived ideas of how to do things, and who have enthusiasm enough to try new methods. Again the mother is grateful to the agent who has helped her daughter to do a difficult task for the home in the best way. Then she is ready herself to receive help from the agent.

The county agent has passed from the garden and poultry plant to the lawn to set up the canning outfit, thence to the pantry where the club member has stored her supply of choice canned fruits and vegetables. She is now a welcome visitor to the kitchen where incidentally she has advised the girl's mother in many household affairs. Her visits of instruction and encouragement have established her place in the affections and confidence of the home. The girls have increased the supply of wholesome food by means of the garden, canning and poultry; they have increased the income of the farm home by their sales of products.

Women have enrolled eagerly to make demonstrations of their own. The entire scope of home and community improvement has been opened by the same careful selection of definite demonstrations that have been followed with the girls. Success with the simplest and homeliest improvement develops initiative and resourcefulness on the part of the women demonstrators. Home-made conveniences and labor saving devices have been stressed.

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Many agents supervised the making of twenty-five to fifty fireless cookers in a county last season, and report their continued use with kerosene stoves to lessen the discomfort of summer cooking. Many other devices such as ironing boards, wheel trays, iceless refrigerators, and equipment for care of milk and butter constantly are being added. In some counties ten home waterworks systems have been installed in a short time as demonstrations is as many strategic points in a county.

Demonstrations which increase skill and give better incomes are gladly undertaken by many women. Some of these have been in home dairying, some in poultry work, others in gardening and canning. An Oklahoma county agent became sufficiently skilled in butter making so that her own butter commanded 15 to 20 cents per pound more than any made in the county. She then enlisted ten women to follow her methods and receive her instructions. Soon many others called upon her for help. One night she heard a call at her gate and found that a man had driven 14 miles to get instructions. He had two new Jersey cows and wanted to know how to care for them and their milk in order that he might make butter as good as she had made.

In several states successful egg circles or egg grading and selling associations are directed by county agents assisted by the college poultry specialist. Soon communities select a variety of chickens suited to their needs and farm flocks are standardized.

In many instances the first approach to problems of sanitation from a demonstration standpoint has been made in the preparation for the canning parties or demonstrations held at the homes of club members. The need for absolute cleanliness and sterilization in canning is impressed vividly because measured by speedy success or failure. Following such demonstrations it is far easier to spread the use of sanitary measures with reference to milk, water and protection of other foods than when problems are attached directly with less tangible and impressive results. There always must be a concrete activity to begin with and the wisdom of its choice is measured partly by immediate results, and further by the extent to which it stimulates other activity and arouses thought and initiative on the part of demonstrators in their homes. County agents all over the South have found the best means of attacking the menacing fly to be to build simple fly traps in which thousands of these pests are destroyed early in the season. This simple device challenges attention and by its practical success urges further preventive measures in the destruction of the larvae of flies in their breeding places.

In the past we have given too little attention to finding the good practices and methods which are in use in many homes and extending these to others. Their obligations to less fortunate or progressive neighbors in their own communities have not been brought home to intelligent women. In seeking out these representative women and seeking their aid in demonstrations, the county agent gains their leadership for their communities. Unconsciously they become her best allies and helpers. Many a demonstration in good bread making, or care of milk or butter, or in the convenient arrangement of a kitchen, gains favor because successfully put into practice by the best housekeeper of the neighborhood.

The quickening of social intercourse is a notable outgrowth of this work. Many a preliminary meeting at a school house where the agent leads in presenting a skillful demonstration is followed by an invitation to meet in a home on her next visit. The alert agent then makes sure that the activities to be carried on in her absence are so practical and well understood that re-

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ports of the women will provide a live and successful topic for the day. The hostess also is helped to be ready to extend simple and wholesome courtesies to her guests. The question of organisation into clubs is of little importance and is not considered until the need and desire for them arises among the women. The decline of so many rural clubs is due to premature organization without a basis of community interest.

An agent recently described a typical community meeting as follows: "Saturday the women and girls met under a large spreading oak, mothers and daughters. The younger children had to come, so they were taught cross stitching, how to peel an apple, and how to clean a lamp chimney. All over ten and under eighteen years old read and discussed the bulletin on 'canning'. Each girl brought a can of products to display which she had put up during the week. Each one did a bit of sewing during the meeting. A demonstration in the use of home-made fireless cookers was made for the women. Rosy June apples were served from a large home-made willow basket." Even this modest picture suggests the possibilities of community meetings under the guidance of the county agent.

It is not difficult to forecast, in part, the future of this work. In a few years there will be a county agent in home demonstration work in every county in the South. Additional district supervising agents will be secured. The state agent will have associated with her an increasing number of home economic specialists who will work through the county agent and supplement her knowledge and skill. Already in some states, one of these specialists is a woman specially trained to meet problems of health and sanitation. In others the poultry expert is a woman. A wide range of technical training eventually must be covered by these women.

The county agent now has an avenue of approach into every activity of the home. With increased opportunity for training which institutions are giving by adopting courses for her need, and with the opportunity and organization for permanent service in her county, the work of the county woman agent will continue to be the most potent influence in the development of fullness of life in country homes.

THE CHAIRMAN. Dr. Meigs, who has charge of the Children's Bureau of the Federal Department of Labor, is present. We would be glad to get her point of view.

MISS G. L. MEIGS. I have not heard the teaching of the care of babies and children mentioned as a part of extension work in home economics. I suppose it has not been determined yet what place that shall take in the extension courses, but all the workers will surely agree that it is a subject of universal interest, alike to city and to country women. Hence a brief statement as to the work of the new children's bureau ought to interest extension workers.

We are so young that many people do not know of our existence. The bureau is just three years old. Its broad charter authorizes it to investigate and report on all matters pertaining to the welfare of the children and child life of all classes of people. Certain phases of its work should interest this section. The bureau has published two pamphlets on pre-natal care and infant care. The latter deals with the care of children up to the beginning of the second year. These bulletins may be useful to teachers in home economics. Single copies may be obtained at any time from the bureau. Unfortunately the present departmental rules do not allow us to furnish large numbers for redistribution, but we can send as many as ten or twenty or more copies to one person on application; or, if a list of names and

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addresses of people wanting these pamphlets is sent to the bureau, they can be sent direct from Washington.

Leaders of home economics often are asked to carry on better baby conferences and to lead better baby movements. We have been glad to help those who have written to us for suggestions in carrying on these conferences, A child health conference is held every day except Sunday and Monday at the exhibit of the Children's Bureau in the Palace of Education at the Panama-Pacific International Exposition. A bulletin will be published shortly, giving directions for carrying on these conferences, and describing the methods of holding infant and child welfare exhibits. You will find that there is demand for child welfare ex- hibits both in the cities and the country. Many organizations have exhibits which can be loaned. The bureau has a small amount of exhibit material which may be sent free of charge, consisting of charts and lantern slides dealing with the care of babies.

The report of the nominating committee was made and, on motion, was received and adopted (see page 154).

On motion, the section adjourned.

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PROCEEDINGS

OF THE

FOURTH ANNUAL CONVENTION

OF THE

Land-Grant College Engineering Association

HELD AT

BERKELEY, CAL., AUGUST 11-13, 1915

Edited by J. L. HILLS, Secretary

For the Executive Committee of the Association of American Agricultural Colleges and Experiment Stations.

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P. P. CLAXTON of Washington, D. C., *Ex-Officio.*

Secretary-Treasurer

A. A. POTTER of Kansas.

Executive Committee

The President.

Vice-Presidents. Secretary-Treasurer.

F. E. Turneaure of Wisconsin.

C. L. Jones of West Virginia. A. A. Titsworth of New Jersey.

For list of land-grant colleges and names of deans of the engineering colleges, schools or divisions, see pages 7-12.

For list of delegates, see pages 13 and 14, the names of the delegates to this Association being included in the list of the older Association.

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Afternoon Session, Wednesday, August 11, 1915

The Convention was called to order at 2:00 P. M. at the Agricultural Hall of the University of California, Berkeley, Cal., by the President, H. W. Tyler of Massachusetts.

Presidential Address

By H. W. Tyler

In the three years that have elapsed since the organization of our society I venture to believe we have accomplished work of permanent significance and value. We have discussed the larger problems of engineering education at the land-grant colleges, not merely as matters of educational theory but with very direct reference to their practical bearings. Out of the long list of subjects in our previous programs, two seem to stand out as preeminent in importance.

1. Engineering extension—the wider and more effective dissemination of skill and knowledge in the field of mechanic arts.

2. Engineering experiment stations—the intensive cultivation of investigation in this field by the development of agencies comparable with the agricultural experiment stations which have rendered so long great service to the arts and sciences in their field.

It has seemed to your officers wise to concentrate attention at this meeting on the second of these large questions, with a view to securing definite progress. Accordingly, papers relating to various phases of this general topic form a large part of our program.

A second most important question with which we have to deal relates to the general status of our Association with reference to the Association of American Agricultural Colleges and Experiment Stations. It has been supposed by some that in the completion of action by the college section, foreshadowed last November, forming a division of that section for mechanic arts, the Land-Grant College Engineering Association automatically will become that division, losing its present name and identity. This simple outcome seems to me, however, open to and worthy of very careful discussion. Certain aspects of that discussion have been outlined already in a memorandum issued by your Executive Committee, and I shall proceed to a brief consideration of them.

The question to my mind is not mainly one of formal organization. The really important thing is the getting together of the men directly and responsibly interested in the mechanic arts side of these institutions in an administrative way, as is the case with those engaged on the agricultural side. The field here in question is not that so well covered by the Society for the Promotion of Engineering Education, nor has the field been adequately filled in the past by the Association of American Agricultural Colleges and Experiment Stations, as is evidenced by the report made this morning by the Executive Committee of that body. (Item 6, pages 22-30.)

The relation of our institutions to the great problem of engineering experiment stations and engineering extension are exceptional, and until these problems really have been solved, the Association of American Agricultural Colleges and Experiment Stations needs, in my judgment, the organized activity of the engineering deans for this purpose. Possibly that organized activity can be had without the special machinery of the Land-Grant College En-

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gineering Association, and I should be the last to favor retaining unnecessary machinery. Our name, however, is honorably associated with a tradition of energetic effort and accomplishment. If our organization did not exist, it would be worth while for the Association of American Agricultural Colleges and Experiment Stations to create it. It surely should not be abandoned so long as it continues to render good and efficient service. I hope that without raising any question of constitutional amendment the college section may organize the new division, but that the Land-Grant College Engineering Association may continue with the necessary measure of autonomy.

The report of the treasurer was submitted by G. W. Bissell of Michigan, as follows:

REPORT OF THE TREASURER

(LAND-GRANT COLLEGE ENGINEERING ASSOCIATION)

RECEIPTS

Cash on hand, November 9, 1914	$111.96
Current dues	380.00
Total receipts	$491.96

DISBURSEMENTS

Reporting proceedings	$141.25
Printing proceedings	261.34
Printing programs for Berkeley meeting	10.25
Miscellaneous	6.24
Cash on hand, July 31, 1915	72.88
Total disbursements	$491.96

There are no outstanding financial liabilities. There are on hand considerable numbers of copies of the proceedings of the three previous meetings of the Association, although those for the second meeting are not very plentiful.

The treasurer's report was referred to an auditing committee consisting of A. A. Titsworth of New Jersey, and E. G. Hoefer of Wyoming, which, later, reported as follows:

The committee appointed to examine the accounts of the secretary-treasurer would respectively report that they have examined said accounts in connection with the vouchers and find them correct and agreeing with the report.

A. A. TITSWORTH,
E. G. HOEFER.

On motion, the report of the committee was received.

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THE PRESIDENT. The Report of Committee on Charges for Professional Services, Dean C. H. Benjamin of Indiana, will be read by the Secretary.

REPORT OF SPECIAL COMMITTEE ON FEES FOR PROFESSIONAL (ENGINEERING) SERVICES IN LAND-GRANT COLLEGES

At the meeting of the Land-Grant College Engineering Association, held in Washington in November, 1914, it was voted: "that the Executive Committee appoint a committee of five, one or more of whom shall be a president of a land-grant college, to consider and report recommendations on the general subject of charges for engineering advice, tests and other services rendered to outside parties by the engineering departments and staffs of the land-grant colleges".

In accordance with this vote, a committee was appointed consisting of: President W. M. Riggs of South Carolina, Dean O. V. P. Stout of Nebraska, Dean A. W. Richter of Montana, Dean F. E. Turneaure of Wisconsin, Dean C. H. Benjamin of Indiana, Chairman.

The subjoined list of questions was prepared and sent to members of the Association and replies were received from 27 institutions.

1. What is the general practice in your institution as regards fees for engineering services of any sort rendered to corporations, municipalities or individuals outside the institution?
2. Are the fees determined by the individual or by the institution?
3. What is the usual rate of charges for expert advice and for laboratory service?
4. How are fees apportioned among the individuals who do the work?
5. To what extent does the institution assume responsibility for the accuracy of the work?
6. On what basis, if any, are free services rendered in work of this character?
7. In your opinion is the method used in your institution the best which could be followed in the interests of the State?
8. Should the interests of the professors, the institution or the State predominate, and to what extent?
9. In your opinion, is it ethical for a college officer to collect a fee for work done in a state college laboratory or for service rendered during time properly belonging to the college, without a definite understanding to that effect at the time of his election?

A synopsis of the answers to the several questions is given in the accompanying table (pages 264-265), which indicates the general tenor of the relies.

Taking up the questions in detail, we may note the following opinions:

1. *General practice.* In most of the institutions represented there appears to be no accepted practice and the matter is left largely to the judgment of individuals. Purdue, Michigan and Minnesota recommend fees similar to those charged by private firms. Nevada has a public service bureau for assistance in matters affecting the public health and welfare, and service in this respect is free. Cornell maintains a research department for control of all commercial work and appears to have a very complete and well organized system. Pennsylvania and Iowa have engineering experiment stations which care for much of the commercial testing and which apparently are well organized. The Massachusetts Institute of Technology leaves this matter entirely to the heads of the various departments and there is considerable variety in the methods of its control and administration.

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In general it may be said that the institutions represented encourage a certain amount of outside work and the collection of fees for the service, but that they exercise little supervision and have made little attempt to organize or control the business. There is a strong feeling that outside practice should be subordinate always to the educational work and that any considerable amount of commercial work is bound to interfere with the proper functions of the college.

2. *Fees.* The fees for expert service, if any, are determined by the individual in every case save three—Cornell, where the fees are controlled by the research department, and Pennsylvania and Iowa where the engineering experiment stations determine the compensation for work under their charge.

3. *Rates.* Consulting service in the various institutions usually is a private matter and the fees charged depend upon the importance of the work and the reputation of the professor. In the larger universities, the rates vary from $25 to $100 per day and in smaller colleges from $15 to $50 per day. These rates are much the same as obtain in consulting practice outside the university. The charges made for laboratory tests range all the way from free service to $100 per day; $25 per day perhaps is a fair average.

4. *Apportionment.* As a general rule, the fees received for laboratory service are apportioned among those doing the work according to mutual agreement. At Purdue, the university receives one-half of all fees for work involving the use of laboratory equipment. At Minnesota, the whole matter is subject to certain regulations by the Board of Regents. At Cornell, the money is received by the treasurer of the university and kept in a special fund. At Pennsylvania, such work is done by the regular staff of the experiment station and the members receive no extra compensation. In the two last named institutions, the individual has nothing to do with the matter of charges. In several of the colleges, the head of the department interested collects the fees and pays his assistants what he pleases. In one or two instances the institution receives a fee for the use of equipment and power, as is the case at Wisconsin.

5. *Responsibility.* In the great majority of institutions, the college assumes no responsibility for the commercial work done in its laboratories. In some the professor is forbidden to use the official stationery in connection with such work. At Minnesota, there are quite stringent rules made by the Board of Regents controlling the matter of private work, the collection of fees and the responsibility of the institution. At Purdue and at Cornell, the university accepts a certain measure of responsibility. It is apparent in this connection that no institution which receives a part of the fees can escape a corresponding share of the responsibility.

6. *Free service.* It seems to be quite a general practice to give advice gratuitously, when it can be done by letter, especially to citizens of the municipality and of the State. Furthermore, in most of the states, individual and laboratory service is given to state officials and commissions. Extension work is done without charge in Colorado, Iowa, Maine and Nevada, while many of the institutions favor the State and the small municipality.

It is also stated quite generally that experimental investigation may be carried on without charge, when the problem is one of scientific interest to the public. The prevailing policy in one of the institutions represented is "to render gratuitously or at cost such service as may tend to assist in the development of the resources of the State or in the advancement of the welfare and improvement of the condition of the communities of the State;

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provided, that in rendering such service the province of the private engineer is not invaded".

Another reply indicates that "a great deal of free advice is given to citizens of the State who are particularly interested in the institution as a 'state institution', this being done to individuals rather than to corporations or municipalities. We believe that the relation of this type of an institution to the various interests in the State is such, that such advice ought to be given to individual citizens and taxpayers in the State, with very small, if any, fee".

One of the correspondents writes that " free service is sometimes rendered where the problem involved is of a general nature, and one which seems to the college to be a suitable one for some extended research. In that case the results are available both to the individual or municipality and the university and may be published promptly by the university if it is so desired. We are much more interested in laboratory work of this character than in strictly private work, and do what we can to encourage this sort of thing".

7. *Methods.* Only a few of the replies indicate entire satisfaction with the methods at present in vogue. Many of the answers show a desire for a more definite and well organized system for handling such outside work as may be necessary. Minnesota seems satisfied with the regulations now in force there. Cornell has a well devised and well regulated system of management which appears to be satisfactory and Pennsylvania's experiment station probably has solved the problem at that institution.

Quite a number of those replying state that a more intelligent supervision of commercial work by the university would be a benefit. One of the replies is to the effect that "we are not able to see how the university can well afford to give free professional service in engineering any more than in law or medicine. To the extent that the engineering college can assist the State through instruction and research, it should do so, but we think that free professional advice is not the function of the university".

8. *Interests to be consulted.* The question as to whether the interests of the professor, the institution or the State are to be consulted received twelve answers in favor of the institution, eight in favor of the State and five where two or more were indicated. We may say then in general that the interests of the institution are paramount, the interests of the State secondary and that the interests of the individual will be served if the other two are cared for.

9. *Previous understanding.* It is the opinion of fifteen of those replying that it is not ethical for a professor to collect fees for outside work unless he has a previous understanding with the authorities. Seven correspondents hold an opposite opinion, while the remainder are in doubt or qualify their answers. One of those consulted would "much prefer to see a professor intensely interested in outside consulting work after performing well the specific duties of his teaching place than to see him get into the frame of mind of doing his work in the class room well and then taking no further interest in his development, which is so often the case when a man does not have work that is pressing him. My experience has been that the engineer who is called upon to do expert work is, as a rule, a live element in engineering teaching".

Another who replies very definitely states that "I am surprised that it should seem advisable to put this question, the answer to which seems obvious. No college officer should be allowed to use a college laboratory for private work except with the thorough approval of his superior officers. If his duties at the college are definitely fixed both as to time and character,

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he should not be allowed to undertake private work which would interfere with them."

A member of the same institution believes that "it is surely ethical for a college officer to collect a fee providing such service does not interfere with the legitimate call upon his time by the employing institution. As a general proposition, I should say that without an understanding to the contrary it is presupposed that an officer in a college can do work for which a fee may be charged when such is outside of his college duties."

Still another in replying to this question says "this whole question is not clear to me. I see the professors of agriculture, men of large training and capacity, serving the interests of the farmer and giving good advice without any thought of a fee. I cannot get away from the thought that in a state supported institution the professors of engineering should give their best efforts to the people of the State; that when their salary has been fixed and accepted they are in a sense under obligation to give all their services. I recognize the strength of the argument that a man becomes a stronger teacher because of his practical experience, but when a professor of engineering tells that his outside fees are larger than his salary, I begin to wonder if he is serving 'God or Mammon'. I would like to see professors of engineering receive salaries large enough so that they would not feel under obligation to their families to hunt for outside work bringing in fees."

SUMMARY

What is most apparent from the correspondence is an entire absence of uniformity in methods for handling commercial work at land-grant institutions. Opinions on principles also are quite at variance. At one extreme we have the individual who advocates free service for the citizens of the State, similar to that afforded by the agricultural and extension departments. At the other is the professor who believes that private practice is purely a personal matter and that the laboratory management should be similar to that of a commercial testing laboratory.

There are visible, however, certain threads of principle running through all this tangle which indicate some agreement. It is generally admitted that work which the individual does on his private time without recourse to laboratory facilities is his own personal business as long as it is properly conducted. It seems to be further understood that certain advice and services should be rendered free to state and municipal bodies as a matter of cooperation. It is also agreed that there are certain problems of scientific interest or of value to the general public which properly may be solved by the college without charge, as being distinctly educational. On the other hand, it is quite apparent that large and wealthy corporations and manufacturing enterprises can not expect assistance which has a distinct money value without paying for it liberally.

The question as to how much or how little service should be rendered free is to a certain extent a local one. The smaller colleges in the more sparsely settled states find it necessary and proper to lend their aid to the development of the industries and resources of the State in every way possible. In the more thickly settled communities, where manufacturing and transportation are in the hands of large corporations, the outside work of the college has more of a commercial character.

In comparing engineering experimentation with that in agriculture, it must be remembered that the agricultural expert is dealing directly with

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individuals, while the engineer has to do with the problems of large corporations sometimes owned and controlled by people outside the State.

The amount of commercial work to be done in the laboratories of an educational institution is a local question which must be settled by each institution in accordance with existing conditions. Granting that a certain amount of such work must be done, it would seem that the charges for work whether it be consultation or experiment, should be such as ordinarily are asked by individuals and firms in private practice. It is not good ethics for an educational institution to cut prices on such work and thus injure the business of individuals or companies.

Further regulation of commercial work by colleges and universities in most instances is desirable. If such work is to be done by college employees, it should be recognized by the institution and suitable regulations put in force. The need of this is felt and expressed by many of the correspondents.

If a university allows its laboratories to be used for outside work and its faculty to engage in such work, it cannot escape a certain measure of responsibility. How this responsibility may be assumed best is a matter for discussion. Cornell accomplishes this through a research department which handles all commercial work as a part of its regular duties. The fees go to the treasurer of the university and are kept in a special fund. Its engineering college assumes full responsibility for all this work. Pennsylvania and Iowa maintain engineering experiment stations which care for commercial laboratory work, establish the fees and take a limited responsibility for the accuracy of the work.

The committee believes that one or the other of these two plans is the proper method of caring for outside work where it is of sufficient importance to need special attention.

The committee further believes that some such university supervision and control is necessary for a proper determination of how much work shall be done, what its character shall be, and how the fees shall be charged and apportioned.

Respectfully submitted for the committee,

C. W. BENJAMIN,

Chairman.

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REPLIES TO QUESTIONS

State	1 General practice	2 Fees	3 Rates	4 Division
Alabama	None	Individual	$1 per hour	No rule
Arkansas	None	Individual	No rules	Mutual agreement
Colorado	None	Individual	$25 up	Personal arrangement
Delaware	No commercial work			
Indiana	Same as for commercial lab.	Head of department	$25 to $100 per diem	One-half to University
Iowa	Regular scale of charges	Eng. exper. station	Cost of work	Eng. exper. station
Kentucky	Both fees and free service	Individual	Variable	Private arrangement
Maine	Private and extension	Head of department	No rules	
Massachusetts	Varies in departments	Individual	$25 to $100 per diem	Individual
Michigan	Same as for commercial	Individual	No consensus	Individual
Minnesota	Same as outside	Individual	$50 to $100 per diem	By comptroller
Montana	Varied	Individual	$15 to $50 per diem	Private arrangement
Nebraska	Varied	Individual	$15 to $50 per diem	Private arrangement
Nevada	Public Service Bureau	Individual	$25 to $50 per diem	No schedule
New Hampshire	Personal arrangement	Individual	$15 to $50 per diem	Private arrangement
New Jersey	None	Individual	Nothing fixed	By agreement
New York	Research department	Department	$2 per hour	By treasurer
North Dakota	Both fees and free	Commercial scale	Various	Individual
Pennsylvania	Eng. exper. station	Station or individual	Commercial scale	Station
Rhode Island		Individual		
S. Carolina	None	No fees		
S. Dakota	Free service	No fees		
Tennessee	Favorable	Individual	$10 to $25 per diem	To worker
Vermont	Little work	Individual	No rates	No system
Virginia	Little work	Individual	$10 to $50 per diem	Assistants $2 to $4
W. Virginia	Favorable	Individual	$10 to $100 per diem	By professor
Wisconsin	Professional practice	Individual	Commercial rates	Part to University

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REPLIES TO QUESTIONS

5	6	7	8	9
Responsibility	Free service	Method (best)	Interest of	Ethical
None	Limited	No	Institution	No
None	No rules	No	Institution and state	No
None	Some extension work	No	State first	No
For work in laboratories	To state and city	Improvement possible	Institution first	Yes
Workers responsible	Extension work	Yes	Institution	No
None	Public interests	Yes	Engineering profession	Yes
	Extension work	No	State	Yes
None	State and municipal	In general, yes	Institution	Different opinions
None	State and municipal	Uncertain	Institution	No
Regulated by regents	Municipality	Good	State first	Regulated
None	State and municipal	Yes	Institution and state	Yes
None	State development	No	Institution	Yes
Public Service Bureau	Public service	Yes	State	No
None	Individual taxpayer	No	State	No
None	No definite plan	Yes	State first	Yes
For official work	None	Yes	Institution	No
Head of department	Letter service	No	Institution and state	Doubtful
None	State and municipal	Yes	Institution	No
None	None	No	All	Yes
None	All free	At present	State	No
		Yes	Institution	No
None	Nearly all	Doubtful	Institution	No
None	Public good	No	Institution	No
None	State and town	No	Institution and state	No
None	State and city	No	Institution first	No
None	Research problems	Yes	State	No

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DEAN C. H. BENJAMIN,

LAFAYETTE, IND.

DEAR SIR:

I have gone carefully through the report of the committee on fees and charges. As a member of said committee I beg leave to submit:

In connection with the presentation of the idea that the private engineer should not meet undue competition from the members of the engineering faculties of state-supported institutions, I believe that attention should be called to the fact that many of these private engineers are our own graduates. It is desirable that a large proportion of the graduates of a state institution locate within the State. It is the function of the college to train them for service within the State. The returns to them from that service must afford them a livelihood, and it is the height of inconsistency and impropriety for the college faculty to make a general and continued practice of rendering, either gratuitiously or in close competition, service upon which the graduates of the college must depend for a living.

In connection with the discussion of free service, may we not allude to the fact that a public agency may render gratuitiously services which beget a demand for the services of the private engineer, or which result in the creation of official positions requiring engineering qualifications? It is to the point to quote from the letter from Iowa State College in reply to Question No. 6. The institution, through its organization as noted, "furnishes to tax supported bodies of Iowa, preliminary educational technical information on public work, to assist the officials in the performance of their duties and to prevent serious initial mistakes in public or industrial improvements. This bureau operates with the advice of an advisory committee composed of practicing engineers and representatives of the various Iowa industries concerned".

The rules in force at the University of Minnesota are characterized as "stringent". They seem to me to be liberal rather than stringent; as liberal in all probability as may be consistent with effectiveness. I should be willing that these rules be adopted for the University of Nebraska practically as they stand. If these rules have the approval of the other members of the committee to the extent that they have mine, I would suggest that they be cited in full in the report or as an appendix. I incline to believe that they will be found capable of adaptation to the conditions at a majority of the land grant colleges.

If the report is intended to serve as a guide in formulating rules or policy in the different institutions, it seems that some additional emphasis should be placed on the li · itations as to character of outside employment. In particular, in connection with engagements on work of a controversial nature, the faculty men should understand that they are not to appear or to advise in behalf of interests opposed to the State, county, municipality or other public body.

At first I thought that some definite specific recommendations should appear in the report, but it has occurred to me that it may be better to assume that the committee will be continued for another year, and charged especially with the duty of formulating such recommendations, in the light of discussion by the Association at the San Francisco meeting.

It may be noted that, as compared with the older lines of engineering, agricultural engineering, as represented by the departments in the colleges,

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finds itself in a position more nearly the same as that which is cited in the report as pertaining to the departments of the colleges of agriculture.

Very truly yours,

O. V. P. STOUT,

Dean College Engineering Univ. Neb.

LINCOLN, NEBRASKA,

June 20, 1915.

DEAN C. H. BENJAMIN,

LaFayette, Ind.

DEAR DEAN BENJAMIN:

I have read with a great deal of approval Dean Stout's letter to you under date of June 29.

Yours sincerely,

W. M. RIGGS,

President.

CLEMSON COLLEGE, S. C.,

July 9, 1915.

C. H. BENJAMIN:

The report of the committee on fees and charges has just been returned to me together with Dean Stout's suggestions and criticisms. I do not entirely agree with these, but believe that local conditions in various states may modify the nature of engineering practice. In this connection, I can only repeat a sentence of the report—"It is not good ethics for an educational institution to cut prices on such work and thus injure the business of individuals or companies." I believe no free service should be given except to state institutions and commissions. I do not see that the municipality has any more claim than the private individual.

In regard to the rules at the University of Minnesota. I still hold the opinion that they are stringent. I should dislike extremely to see such rules in an institution with which I was connected.

While it is apparent that the use of university laboratories and apparatus justifies university rules with regard to such use, I believe that the engineering services of a member of the faculty are his own to dispose of as he sees fit as long as his outside work does not interfere with his college duties and as long as he violates no rules of business ethics.

As regards specific recommendations, I doubt whether it would be possible to agree upon any. As far as possible in the report itself, expressions of opinion have been omitted, and it is much to be doubted if the members of this committee could agree upon any specific recommendations. The conditions in the various institutions, East, West, North and South, vary so much that probably it would be impossible to formulate rules which would be satisfactory to all.

R. J. ALEY of Maine. This paper goes to the core of the whole matter. Various land-grant colleges, through their agricultural departments and experiment stations, have educated our people to expect too much free service in the field of agriculture. What may be the final outcome I do not know,

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but already there appear to be many signs pointing toward a popular demand for a somewhat similar service from the engineering departments of the land-grant colleges. For example, within a week after the Maine Public Service Commission formally was established, its representatives asked our engineering faculty to render certain services; to formulate rules for its guidance in dealing with power plants, electricity, railroads, gas companies, etc. It is difficult to refuse such a request, but when service is rendered for one section of a state, others seek similar assistance. While compliance with such requests will not put money directly into the pockets of the engineering faculty members, who may consider that they are giving too much of their time to this demand, ultimately it may add materially to the resources of the institution, and in a roundabout way may make possible the payment of higher salaries.

A citizen who wishes to install a private electric light plant on his farm has just as much right to seek expert advice and direction on that subject as he has to ask for expert advice if he is going into the poultry business. The latter demand is recognized and the applicant gets his advice free. The former demand for free advice is not yet recognized. I mention this merely because it helps to illustrate the point that our citizens are beginning to demand such service, not only from the engineers but from all departments. Incorporated towns and small cities ask departments of sociology and economics to give expert advice relative to certain social considerations and problems. The University of Maine was asked by the school authorities of the second city of the State to make a brief survey of its schools. The request was heeded and I believe the service rendered was of great value.

I do not know the answer to this question. Apparently it is a complicated one, and, as was pointed out in the committee's report, there is the possibility of coming into conflict with the graduates whom we have trained as experts. There is the possibility, also, of coming into serious conflict with various corporate interests.

A. Marston of Iowa. A technical service bureau has been organized at the Iowa State College to render educational and research service. Considerable opposition arose at first among the private engineers, owing, as we think, entirely to a misapprehension of the nature of the work which we are undertaking. They thought that we proposed to compete with them by rendering without charge the same kind of engineering service as themselves. This difficulty seems to have been overcome by holding frank conferences with them. We have an advisory board composed of practicing engineers, to the members of which a report is made of every instance of advice and service.

We have held two conferences with the executive committee of the Iowa Engineering Society and one with a committee representing private consulting engineers, and between us have adopted specifications to govern our bureau work. This work is of such character that many delicate questions arise; indeed as it develops all of us will have to feel our way. A very urgent demand was made upon our institution for this work. It came from the Iowa Municipal League in the first instance, which would have had us go much further than we thought proper or wise. It also comes from individual citizens and cities. Council Bluffs seeks our help in the solution of an important flood protection problem. The local engineers in that city seem as anxious as the city officials to have us make a preliminary investigation and report and help them to start a very costly improvement. I am told that for 45 years the citizens have resolved after each flood to solve the problem and have promptly forgotten their resolutions when the dry season arrived. The local

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authorities think we can educate the community to actually undertake the improvement.

Such work by the land-grant institutions ought to be restricted to educational and research lines. In the instance which I have cited the service rendered to that community is educational in its character. We must, to succeed, educate Council Bluffs to believe that it is to its advantage to spend half a million dollars to protect itself from annual flood damage. A private engineer could not render that service as well as a public institution. We start with the reputation of a state institution, with the belief by the citizens that we have nothing to gain or to lose by our recommendations. We do not propose to make plans or specifications. If the proposed improvement is authorized it will be to the advantage of the private engineers of the locality. We intend to confine the field of work of our technical service bureau to educational work, to the carrying of technical information to officers who have direct charge of public improvements. We do not propose to render the direct engineering service which a private engineer would render. We expect to conduct research work and to publish the results in bulletin form for general distribution. Such a type of service meets with no opposition.

The question whether or not members of our engineering faculties should do private work is a somewhat delicate one and it has been more or less widely discussed throughout the land. Every institution is vitally interested in it. Many private engineers criticise such competition which in their judgment is unethical and unjust. Such criticism has been expressed especially during the present period of general depression, when engineering work is not very plentiful.

About seventy engineers are employed on the staffs of the Iowa State College, station and extension service. I am of the opinion that all the private work which these seventy engineers do in the course of a year would not occupy the full time of one man. On the other hand some arguments are presented against private work by our faculty which appeal to me strongly. It is asserted that even if the work done is small in amount it is liable to set standards for the work of private engineers. Hence I believe that charges for such work should be at least as high as those made by private engineers. The latter are obliged to maintain offices. They can not secure students for assistants for the short periods of time during which they desire to use them on individual cases. We should confer frankly with private engineers in our respective states and agree with them touching methods of regulating this work. It is possible to meet these difficulties as they arise. I hardly think we are prepared to adopt regulations to govern all phases of work, unless they are subject to change from year to year.

F. E. Turneaure of Wisconsin. I agree with the substance of the committee's report. It is a report of information rather than of recommendation. To formulate rules of practice is evidently difficult, for varying conditions must be met in the different states. I believe it will be possible, however, in the near future to formulate certain general principles along the lines suggested by the last speaker. If one keeps clearly in mind the fact that a college or university is primarily an educational institution, the individual questions which arise will be more readily solved. It will also be of much assistance, as new questions arise, to have at hand detailed information regarding the practice of various institutions.

There would appear to be quite a difference in practice with respect to institutional engineering advice and similar agricultural advice. The practice at Wisconsin, so far as possible, is to make agricultural advice general

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rather than individual in character. Demonstration farms, demonstration plots and the like are used for the benefit of the community rather than of the individual.

As to professional work and the charges made for such work, we have on the other hand, as an extreme, the professor who is called upon to give his opinion in a court of law, an expert opinion which requires no use of university plant, but some use of his time and considerable use of his experience. This is clearly a case of personal engineering service. On the other hand we have an ordinary laboratory test of samples of cement sent by a city or by private parties to be tested. The work is done by a skilled laboratory attendant, or even a skilled janitor, and laboratory apparatus is used. It would seem in this case to be quite in order for the institution itself to do the work and receive the fees.

By taking into consideration all varieties of service it would seem possible, though doubtless difficult, to formulate certain principles which would be of very material assistance. I hope that the committee will collect further information and endeavor to formulate such principles.

C. Derleth, Jr., of California. We should be slow to formulate rules. It were better to let time elapse before we attempt to crystallize opinion. When the Association does prepare rules, they should be terse and not too explicit. Our judgments must change from year to year as the problems and attitude of the public vary; also because a general rule cannot apply to all communities, for problems are distinctly different in different localities.

The University of California recognizes three distinct groups of service which may be rendered by engineering departments. First, there is the aid to be given by instructors through use of university equipment, such as chemical laboratories, testing apparatus, etc. In this group we find by far the most frequent service given to the public. In our testing laboratories we are guided by rules which have been in force for a number of years, but these regulations are not published. We refrain from making routine tests; for example, we object to the testing of steel bars for ordinary reinforced concrete work, or of cement to be used in daily construction, because thereby we would compete with five competent testing firms who make a business of commercial testing in the San Francisco Bay region. Some colleges are so located geographically that they would not compete with testing firms when doing routine work. A genuine service might thus be rendered by them; but the question at once arises, how much routine work could a department wisely do? So long as the amount is limited the problem would not be a difficult one.

Our testing laboratory welcomes the opportunity to make unusual tests of material, particularly tests for which the commercial firms have no adequate apparatus. We are constantly serving private parties and the public is making tests of an investigational and educational nature and in these we reserve the right to publish results. It is our custom to charge the actual costs of tests. The fees are collected by the university comptroller and credited to a revolving laboratory fund. Instructors and laboratory assistants do not benefit financially from the income of tests. They receive definite salaries fixed yearly by the Regents. Sometimes we make routine tests, for example of cement, acting as an arbiter when the cement company and the contractor both seek an aid. In such special cases we charge at least current prices. In submitting a report the condition is that we shall not be drawn into controversy.

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The second type of service is rendered by an engineering department or its individuals in giving educational advice. A sanitary professor may lecture before a town audience describing the need for improvements to a sewer system. Another instructor may interest a community in good road construction. A third may explain building laws. In many ways members of an engineering staff can assist town councils, county boards of supervisors etc. Our experience shows that it is difficult to make the layman distinguish between advice of an educational nature and information which should be given by practising engineers. Requests often come either from private individuals or public bodies calling for the preparation of plans and specifications. Sometimes the request involves the responsibilities of inspector and contractor. Not only are plans asked for but a particular university department is called upon to supervise and vouch for construction. An engineering department should firmly refrain from rendering services which cause it to compete with designing and consulting engineers. It should be the policy always to give instruction on engineering matters and to inform the public where they may get competent engineering assistance.

The third way of service, it seems to me, is purely a personal matter. If there is in any institution an expert lawyer, doctor or engineer, who, drawing upon his personal experience and peculiar attainments, gives services, public or private, which in no way require the use of university office or equipment, surely such a man should be free to serve the public on his own terms so long as he does not neglect his university duties or use university time in his private interests. When the university specialist renders personal services he must not underbid practising engineers. He must not seek private employment. He should be known to the public for his achievements so that private, state and even federal authorities will seek his services.

Just what should constitute an even balance between the amount of consulting practice and the amount of teaching and college activity, must be left to personal conference between the executive head of the university and the individual professor.

On motion, the committee was continued.

THE PRESIDENT. A committee report on Engineering Extension Text-Books, prepared by Dean L. E. Reber of Wisconsin will be presented by the Secretary.

REPORT OF THE COMMITTEE ON EXTENSION TEXTS

The report of the committee is confined largely to the activities of the different institutions represented in its membership. From the beginning of extension work in engineering lines, it has been found necessary to develop special texts that would approach the subjects in a manner fitted to the preparations of the students, that would present the subject matter in a form in which the practical applications would be evident, and that would give complete instruction without leaving so much to the personal relation between student and instructor as is required with most textbooks.

PRINTED TEXTS

Owing to the newness of the work, many of these texts are still in trial form. The largest list of published texts for this work is that of the Wisconsin extension division, issued through the McGraw-Hill Book Co. Ten of these are now issued in book and pamphlet form and two others are in press. The

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use of the pamphlets is especially desirable for extension work, because it confines the student to the immediate task in hand. The courses now available in this form are:

Shop Arithmetic,
Advanced Shop Mathematics,
Shop Sketching,
Steam Boilers,
Heat,
Electrical Meters,
Magnetism and Electricity,
Elements of Structures,
Reinforced Concrete,
Vol. I. Principles,
Vol. II. Buildings and Retaining Walls.

In addition, two others are in press:

The Gasoline Automobile,
Reinforced Concrete,
Vol. III, Bridges and Culverts.

Others which are likely to be published soon are:

Refrigeration,
Gas Engine Ignition,
Machine Drawing.

The extension department of the Iowa State College has published through John Wiley and Sons the first of their texts, viz.:
Carpenters' and Builders' Arithmetic.

For some courses, especially those for more advanced students, it has been possible to find texts on the market that would serve the purpose, generally by using supplementary material, at least until such time as special extension texts could be prepared. Among those books that have been used for extension courses are:

Elements of Mechanics, Jameson,
Elements of Mechanics, Merriman,
Strength of Materials, Merriman,
Plumbing, Cosgrove,
Lumber, Kellogg,
Heating and Ventilation, Allen,
Overhead Power Transmission, Still,
Elements of Electrical Engineering, Franklin & Esty.
Power Plant Economics, Gebhardt,
Machine Design, Halsey,
Plate Girders, Moore,
Framed Structures, Marburg,
Steel Construction, Burt,
Masonry Structures, Baker,
Telephone Prin. & Practice, Wilder,
Surveying, Breed & Hosmer.

MIMEOGRAPHED TEXTS

Both the Wisconsin and Iowa divisions have issued several courses in mimeograph form, which will eventually be published after they have been tried out sufficiently. The Pennsylvania State College also reports using some courses in this form, but does not give titles. Other colleges no doubt have done some work in this way.

As the majority of extension courses will be in this form for some time to come, due to the newness of the work and its rapid growth, some exchange arrangement should be effected so that the institutions engaged in this work could enlarge their scope by the use of all the available courses.

The Wisconsin courses now available in this form are:

Shop Drawing,
Sheet Metal Drafting,
Mechanism,
Gas Engines,
Gas Producers,
Refrigeration,
Course for Janitors,
Cupola Practice,
Direct Currents,
Alternating Currents,
Principles of Steam Engineering,
Fuels.

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The Iowa State College reports having the following in this form:
Elementary Concrete,
Manual Training for Rural Schools (in bulletin form),
Sheet Metal Drawing,
Advanced Mechanical Drawing and Inventive Problems,
Carpenters' and Builders' Drawing,
Automobile Care and Operation (Tires, Carburetors, Ignition, Costs, in pamphlet form).
They also report the following courses in preparation:
Carpenters' and Builders' Estimating,
Architectural Drawing.
Manual Training for Rural Schools (continuation of one in preceding list),
Short Course for Steam Fitters,
Short Course for Janitors and Firemen,
Short Course for Telephone Men,
Short Course for Electricians.

Naturally a list such as these given here would seem to be a rather miscellaneous collection of titles without correlation between courses, but most extension texts are prepared with the view of meeting a present need of the worker and at the same time fitting into a comprehensive scheme of education for the particular industry that will lead the student as far as he has the ability and the perseverance to go.

TEXTS NEEDED

There are some industries which are demanding technical instruction for their workers and for which, so far as is known, there are no texts available. These subjects ought to be provided for by some institution. Among these are:

Papermaking,
Painting and Decorating,
Furniture and Fixture Designing,
Milling,
Telephone Work,
Railway Mechanical Engineering.

SUGGESTIONS

It is urged especially that those institutions which are developing texts in printed or mimeograph form make provision for an exchange arrangement with the other institutions whereby we all may have available the work of others and thereby give our work the broadest possible scope.

It seems desirable to urge the different schools which are developing texts to communicate with the committee or with the other institutions in order that duplication in this costly work may be avoided. Where two or more schools are endeavoring to prepare courses for the same class of men, much time and effort would be saved if they could agree beforehand on the division of the field into courses and on the general method of attack. They could divide then the preparation of the various courses among themselves and save both time and money in covering the field. Many lines are the same the country over. Among these might be mentioned the work of telephone employees and steam engineers. In some industries, such as mining for example, the nature of the work is sufficiently unlike in one locality as compared with another that probably it would be necessary for each school to work out its own texts to fit local conditions.

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It is possible that it may be desirable to consider the feasibility of exchanging facilities to the extent of carrying the instruction in certain lines. Some schools may have men capable of giving instruction in certain lines while others do not. If such a scheme were put into operation, then men at one institution could carry the correspondence instruction for several states and thus do the work more economically than if each college tried to use its own men in all lines. It is necessary for us to work together to the fullest extent in this work, as it is expensive to undertake. The cost becomes almost prohibitive if one tries to work alone. By cooperating, the work may be given a broad scope without making the cost excessive.

L. E. Reber,
J. A. Moyer,
K. G. Smith,

Committee.

A. Marston. Cannot some means be devised whereby methods of exchange might be established? We ought to know the conditions under which different institutions exchange texts. Wisconsin easily leads in this matter. The officers in charge of this work there have been generous in allowing other institutions free use of Wisconsin texts. In some instances the institutions using exchange texts apply covers of their own, but giving proper credit, of course, to the University of Wisconsin.

On motion, the committee was continued with a view to developing some method of exchange of text-books between institutions.

The President. Dean A. W. Richter of Montana, will present a paper on "The Adaptation of Engineering Education to Local Needs."

Adaptation of Engineering Education to Local Needs

By A. W. Richter

When changes are made in the curricula of engineering colleges looking towards increased time requirements, objections are offered promptly. Much is made of the student's age. Believing that the work in the lower grades has decided bearing upon the problem, the solution of which seems in some measure bound up with modifications in the lower grade school work, the writer has given some consideration to the question of the early training of youth.

A college of engineering must produce men educated in the broadest sense of the work, who can take an active part in the commercial and social development of the State. Its graduates must be well grounded in the technical details of their profession, should be familiar with the special needs of their own State, and should be willing and anxious to be of service to the State in which they may live; and as a rule engineering graduates measure up to this standard.

There has been much discussion concerning the introduction of the so-called general "cultural" courses into engineering curricula, and few persons question their desirability or commercial value. When the joint committee of engineering societies, appointed "to examine into all branches of engineering education", makes its final report, it may be expected that this question will have been given much consideration. In order to offer to the engineering student more of this work some of the technical studies now given must be eliminated, or else the number of years required for graduation must be increased. Those of us who are actively engaged in training boys for the

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engineering profession see clearly that little can be sacrificed in technical training, that, instead, more is needed. On the other hand, the six-year course is decried on account of increased expense and of delayed entrance into active life work.

Probably it will be conceded that the primary object in view in appropriating state funds for the purpose of training a favored few, is the mental advancement of potential leaders in the development of the state's resources, whcse work should help to increase material wealth and happiness.

In engineering colleges it is insisted that education shall spell "efficiency". It is doubtful if this can be said of the education offered in the public schools and especially in the lower grades. Why should there be hesitation in applying the efficiency test to all public school work, to that of the grades as well as that of the high schools and colleges?

Many of our communities have increased greatly in population, and there are too few teachers in the lower grades to adequately handle the increased classes. Consequently the child dawdles along for the first three or four years, learning slowly and losing interest. Little real advancement is made between the first and third grades after the child actually has learned to read simple words and to add and subtract simple numbers. If the ratio of teachers to pupils was narrowed greater progress would be made and valuable time would be saved, which might be spent to better advantage in school work of a higher grade.

Greater efficiency in the work of the lower grades should teach the boy to think and practically to apply what he is learning. Thus interest is maintained, mentality developed, and a wide awake child, eager to learn is seen instead of a listless lad absorbing in routine fashion facts which mean nothing to him. Lower grade teaching is inefficient, but the parents and the public do not realize it. Many prominent educators recognize the situation which it seems impossible to alleviate until the parents take a more decided interest in the schools.

We recognize the fact that there are inevitable time limits to the preparatory courses. It is immaterial whether a student spends an extra year or two in high school or in college, provided he is not unduly delayed in his entrance upon his professional work. Doubtless if the lower grade work were remodelled on the efficiency plan, ample time would be available for the introduction of purely cultural courses into engineering curricula. Modern language might well be taught in the lower grades. Several subjects now taught in the high school could be carried easily at a much earlier age, leaving ample time for a study of economics, business organization, commercial law, etc., in later school and college years. If it is urged that the mind is too immature for such work in the grades and high school, it should be remembered that "the mature mind of a student depends upon opportunity and environment rather than age."

Granted, then, that engineering students may be expected to have received a good general preparatory course with general cultural work, and that the engineering colleges are affording the purely technical training, the question arises to what extent should these colleges attempt to adapt their courses to meet the special needs of the states in which they are located? A student trained in technical details and for a broad field of social activity might be able to solve local problems as they appear. It is apparent, however, that a student who specializes along lines of work particularly adapted to meeting definite state needs would be more likely to advance its interests rapidly and to be more useful to the state than would a student educated solely along general educational lines.

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In this connection, it is interesting to note that an examination of the alumni lists of several great institutions disclosed surprising facts, indicating to what extent engineers are trained who practice in their home state.

The following tabulation gives the proportion of engineering alumni remaining in the states in which they received their education, as shown in the last alumni catalogs of six institutions. The writer was not able to examine the records of all engineering schools, but these serve to illustrate the point.

Institution	Living engineering alumni.		
	Total	Remaining in State	Percent in State
A. (1849-1911)	1200	376	31.3
B. (1875-1912)	904	429	47.4
C. (1871-1915)	1613	615	38.1
Civil engineers only:			
D. (1898-1915)	187	117	62.5
E. (1897-1913)	186	116	62.3
F. (1885-1914)	680	124	18.2

Distance lends enchantment. Many engineering graduates, perhaps half of them, may be expected to leave their native state to enter upon their life work; on the other hand some engineers from other states will come to take their places.

The writer would not be understood as implying that technical training possesses no broadening influences:—quite the contrary; but it should be supplemented by the introduction of courses having a tendency towards a broader culture and a business training.

President Van Hise says that "In proportion to the resources, I believe larger results for the world will be obtained by that institution which recognises local responsibility than by the institution which feels no special obligation to the community in which it happens to be located, and has simply before it as its ideals, pure culture, pure learning, pure science, with little or subordinate thought of immediate service." It must be conceded, however that the State appropriates money to its educational institutions in order that students may be trained primarily to meet the special needs of the State in which they are educated, and the institutions are increasingly recognizing their responsibilities. Extension Work has become quite common. Courses in irrigation engineering have been introduced in states with large areas of irrigable land. Colleges located in states with large water powers should train young engineers so that they may assist readily and finally lead in the development of this great resource. Iowa and Minnesota would not be justified in spending money to train their young men to construct and manage irrigation systems on the arid lands of Idaho. Such a specialized course of training naturally is carried out in Idaho, Montana, and states similarly situated. Texas and Massachusetts might be interested properly in courses pertaining to textile engineering, whereas Montana and Idaho would scoff at the idea of giving specialized instruction in cotton machinery and the manufacture of cotton goods. No engineering college can afford to maintain courses covering all of the various specialties. In addition to the general courses of civil, electrical and mechanical engineering, each institution should

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attempt to meet only its special needs by offering such additional courses as will tend to produce men most capable of leading in the development of the special resources of its own state. Montana should pay especial attention to courses pertaining to the development of hydraulic power, to the irrigation of its lands, to mining and the utilization of its ore deposits, to forestry and to the lumber interests.

THE PRESIDENT. Dean C. A. Covell of Oregon, will discuss "The Correlation of Courses of Study in Engineering".

CORRELATION OF COURSES OF STUDY IN ENGINEERING

By G. A. COVELL

While it is true undoubtedly that approved business methods are entering more and more into the financial management of colleges and universities, it is doubtful if the same careful consideration extends throughout the organization of these institutions. Plain business principles dictate that all receipts and expenditures of funds should be under a department headed by a responsible business manager; that the bookkeeping and accounting should be done by experts giving their whole time to the work.

Since the publication in 1910 of Bulletin No. 5 of the Carnegie Foundation, containing the report of Mr. Cooke on "Academic and Industrial Efficiency", a great deal of discussion has taken place on this subject. At the Boston meeting of the Society for the Promotion of Engineering Education in 1912, scientific management was expounded by its inventors and most earnest advocates as the one thing lacking in our colleges and universities to make them of greater service to the people at large, and to save them from financial ruin.

Since then, so much has been said and written about academic efficiency that to a certain extent it has become a tender subject with those engaged in college and university work in the capacity of teachers. The results of this agitation no doubt have been beneficial, since keen interest has developed and the weak places have been pointed out on both sides of the arguments presented.

It is not the purpose of this paper to enter the field of conflicting theories and to advocate radical changes in the curricula of the land-grant colleges, or to suggest reorganization along lines differing from those followed at the present time in order to produce ideal results. I propose rather to present a few facts and suggestions, based largely upon personal observation, which I hope may be of interest in some cases. What I have to say will apply more directly to the separate land-grant colleges than to those having the university organization.

The problem confronting the divisions of engineering, or engineering schools, of the land-grant colleges rapidly have grown more and more complex. This is particularly true in a number of the Western states, where appropriations have not kept pace with the rapid growth of the institutions, and consequently concentration of effort is essential. One of these problems is the correlation of studies and courses in engineering to avoid duplication and to intensify the work.

These institutions usually draw their heads of departments and administrative officers from the large universities, with the result, in some cases, that the university organization is appropriated and applied to conditions which require and should receive special and independent treatment.

The college ordinarily is divided into departments, each with a responsible head and the necessary number of subordinates to perform the work in a creditable manner. These departments naturally fall into two groups:

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(1) Departments offering major courses leading to a degree.
(2) Service departments.

The former group controls the curricula leading to degrees in the various lines of engineering—civil, electrical, mechanical, etc., while the function of the latter group is no less important, but is merely auxiliary to the former, rendering such aid as may be required by the degree courses.

A list of the general service departments includes such subjects as English, modern languages, mathematics, economics, chemistry and physics. The departments of mechanical darwing, surveying, hydraulics, mechanics, engineering laboratory, and shopwork also contribute strictly technical work to the courses of study in engineering.

A close investigation usually will show that these departments are working largely along independent lines shaped without careful reference to the requirements and needs of the varied interests which they serve. Much has already been done through the efforts of the Society for the Promotion of Engineering Education to bring about closer relations between the service departments and the engineering interests which they serve, but each institution must solve its own problem in this respect. Many difficulties are encountered in the solution.

Heads of departments are arbitrary and resent suggestions made by engineering departments concerning the service rendered. Instructors do not maintain the proper attitude or possess the requisite ability to meet requirements imposed by other departments because their field of vision does not extend far enough in a particular direction. As a result, we have a vast aggregation of subjects which rightfully belong together, but which are not properly fitted with reference to the whole. We are trying to build a solid structure of rocks carefully fitted together, but find instead that we have only a pile of loose stones. In order to meet the requirements and prevent duplication, a careful organization and hearty co-operation among departments is required. A perfunctory organization where these matters are discussed in meetings of the engineering faculties in itself is not sufficient; and the dean, or other administrative officer, should insist that interested departments get together in conference and work out syllabi of courses so that definite results may be obtained. More teachers who have had engineering training are needed in the service departments of mathematics, English and physics. The engineering departments offering degree courses to meet the needs of students taking service work in these departments but laying more stress upon other lines of work should have a better understanding also.

Much unnecessary duplication of work within an institution is caused by the desire of each engineering department to build up and maintain a complete unit in itself instead of accepting service in class room and laboratory from other departments, naturally better equipped to render the service. For example, all of the shopwork courses offered in a college would be given in a department where this kind of work is the leading feature, not necessarily a minor adjunct to the department of mechanical engineering. This department, as suggested by Professor Diemer, should be in charge of a broad and capable man ranking with heads of engineering departments. He would study the needs of the different groups of students taking work in his department, both with reference to the major lines of work taken by such students while in college, and also with reference to their probable future places in the industries of the state. Conferences should be held with the heads of the mechanical, electrical, mining, and other departments to determine the scope of required work. The shop department should be in close touch

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with the manufacturing and other industries of the state, to study their requirements and to put the engineering graduates in a position to be of real service to them.

The engineering laboratories may be conducted profitably upon the same plan as that outlined for the shops. In this case the laboratory department becomes a service department for all of the engineering divisions, with the possible exception of electrical engineering, in which case it seems desirable to have the laboratory within the department. The head of the laboratory should have equal standing with other heads of departments, and should have a competent corps of assistants specializing in different branches of laboratory work, such as materials, cement, highway and steam and gas engine laboratories. The courses offered should be complete in themselves and planned with special reference to the needs of students in the various engineering groups, such as civil, mechanical, highway, etc. It is desirable also to offer facilities for elective work to accommodate students who are specializing or doing research work, as well as those who wish to obtain some knowledge of laboratory methods by electing general courses.

These laboratories should, and usually do, perform a valuable service to the state through cooperation with state bureaus and commissions in making tests and standardizing work. County and municipal authorities also call frequently upon the laboratory to furnish information concerning materials to be used in public works. Where funds are available, research work is carried on with special reference to the development of the resources of the state or the improvement of industrial processes.

In all of the instances cited the independent departmental organization with central authority is preferable to separate laboratories scattered throughout the institution and administered under different departments. Duplication both of equipment and courses is avoided and concentration of effort and intensity of purpose are attained.

The economic and satisfactory administration of the engineering work pertaining to agriculture forms one of the most delicate and perplexing problems with which the land-grant colleges have to deal. Agriculture is demanding more and more technical engineering work for students whose principal work is in the several divisions of that subject. Shall these courses be given in the school of agriculture, or shall they be given exclusively in the school of engineering as a service to the school of agriculture? If the former plan is adopted some duplication of equipment and instruction necessarily follows. For example, certain shop and laboratory courses always are required. If these are given in the school of agriculture, room and equipment as well as instructors are duplicated. Courses in surveying and in elementary hydraulics are regarded as essential for students in studying irrigation farming. These courses belong strictly to the engineering side of the institution and should be handled there, but with a careful consideration of the purpose for which the student takes the work. If the purpose is to obtain a working knowledge of the instruments and the elementary principles of civil engineering as applied to irrigation farming, the course should be planned and conducted with this purpose always in view.

Young instructors in engineering to whom such classes are likely to be assigned often will forget that they are not training students for engineering, but for an entirely different purpose, and will fall far short of attaining the ideal result. I believe engineering instructors attempting such work should be required to take as a preparation such subjects as soil physics and some courses in agronomy.

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On the other hand, it seems absurd to have the department of agronomy, or some other division of the school of agriculture, fitted up with all of the engineering equipment necessary to teach surveying and elementary hydraulics, and thus duplicate work which must be given in the school of engineering; for the work will be unsatisfactory unless the instructors are chosen with reference to their engineering qualifications.

Several of the land-grant colleges have established departments of agricultural engineering to solve the problem of providing for the ever increasing demand for technical engineering by students in scientific agriculture. Some colleges have gone so far as to offer degree courses in this work. I believe this plan will be adopted generally in the future. It correlates the work of two divisions which have been too much inclined to hold aloof and to regard each other with suspicion. Agriculture is benefited greatly by this arrangement, in that students are enabled to get the kind of engineering training they require in well organized departments instead of picking out here and there from engineering courses a few ill-assorted fragments, sometimes grudgingly given by a department having no great sympathy with the demands of the student.

And here permit me to ask: Is it not true that there has been a lack of sympathy and appreciation as well as a lack of correlation between the agricultural and engineering divisions of our colleges? Has not more attention been given to the matter of securing an adequate share of the funds appropriated than to a consideration of the best interests of all of the students?

A department of agricultural engineering is an engineering proposition and should be administered as such. However, provision must be made to differentiate the work in favor of agricultural training just as we differentiate it to produce civil, electrical, mechanical or chemical engineers.

In order to avoid duplication and to correlate work in the engineering courses, the following points seem to stand out prominently:

The integrity of the departmental organization with general engineering administration and supervision over all.

Strict attention to the requirements of the service in case of service departments.

Close cooperation of all engineering departments with a definite purpose of building up the entire school, or division of engineering, rather than the undue expansion of any individual department.

Friendly cooperation between engineering and agriculture in order efficiently and economically to cover the field of agricultural engineering.

The same may be said with propriety of the several courses in engineering with reference to each other. The student in mechanical engineering naturally will require some courses which are given in the civil engineering department. The latter department has the equipment and instructing force to perform the service to the advantage of both departments, if proper attention is given to the requirements of the mechanical students.

The broad, fundamental training in mathematics, economics, language, and the sciences forms the real engineering education. It is here that the reasoning powers are developed, breadth of vision established, and power of expression secured. The strictly technical courses which are added during the junior and senior years are valuable to give character and direction to the result, and to give a finish by which the product is judged in the world, but they should be used judiciously and combined carefully in order to produce good working results.

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If these courses, forming the superstructure of an engineering education, are too ponderous and massive for the foundation, a top-heavy structure results which never is in stable equilibrium, but always is ready to fall when the real test comes. If the finishing courses are confined strictly to one definite branch or line of work, such a policy will produce the narrow specialist, who is helpless when thrown out of his own little groove.

The real, virile graduate in engineering is the product of a well-balanced course, not too much crowded with technical work, but based upon the fundamentals of a good general education, where overlapping and duplication of work have been carefully avoided, and where correlation always has been the watchword.

This result also squares itself with the principles of efficiency engineering, for it represents a maximum output at a minimum cost.

On motion, a recess was taken until 9 A. M., Thursday, August 12.

Morning Session, Thursday, August 12, 1915

The Convention was called to order at 9 A. M. by the President.

The President. The chair appoints as committee on nominations, A. Marston of Iowa, C. W. Hewitt of New Hampshire and A. W. Richter of Montana.

Bill for the Establishment of Mechanic Arts Experiment Stations

By O. L. Waller

This paper took the form of a proposed bill establishing engineering experiment stations, using throughout the phraseology of the Hatch Act substituting the words "mechanic arts" for "agriculture" and stating the proposed objects and duties in somewhat different language.

In discussion the following views were expressed: that the duties of such stations as laid down by law should be phrased in general rather than in specific terms; (per contra) that general terms were undesirable and that clear, full non-technical specifications were preferable; that specific statements would be likely to result in duplication of work now done under state and federal auspices; and that in states where state universities and land-grant institutions are not united, conflicting interests would be likely to assert themselves.

On motion, the executive committee was authorized to take such steps as seemed advisable in the furtherance of the campaign to secure federal aid in the interests of engineering experiment stations.

The President. "The Adaptation of Engineering Experiment Stations to Local Needs", will be discussed by F. E. Turneaure of Wisconsin.

The Adaptation of Engineering Experiment Stations to Local Needs

By F. E. Turneaure

The development of engineering experiment stations and research laboratories in many of our engineering schools in the past few years, raises the important question as to how greatly the facilities of such laboratories actually are needed to meet the local demands of the State and to what extent they may be used profitably for the solution of general problems that can be studied at one place as well as another.

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That local needs should be studied and provided for in advance of work of a more general character goes without saying; but the question may be asked whether the variation in the local needs of different states alone is sufficient to warrant the maintenance of separate individual laboratories, or whether the chief work of such laboratories is likely to be of a more general character, in which case large expenditures by each state might be questioned still more seriously.

To assist in an efficient and economical development of these experiment stations would seem to be one of the most important lines of activities of this Association. This is a matter of concern, not only to the several states but also to the Federal Government, just as in the case of the agricultural experiment stations. In the latter case the same general question has arisen. Many of the agricultural problems are local in nature and many of them also are general, and one of the means utilized to assist in the correlation of this work has been this Association of American Agricultural Colleges and Experiment Stations.

As compared with agriculture, the problems in the field of engineering would seem to be more general. In agriculture we have to deal with wide variations of climate, soil and market conditions, and with a great variety of agricultural products. In one state the important problems relate to corn growing, in another to wheat, in another to cotton, in others to dairying, live stock, fruit, tobacco, irrigation and the like which are even more numerous than the states themselves. In spite of such great variety, however, there is likely to be a large amount of overlapping and unnecessary duplication of effort which can be prevented only by a careful consideration of the peculiar problems of each state, the facilities available, and the work that is being accomplished at other institutions.

In the field of engineering the variation in conditions in some respects is less than in agriculture. Materials of construction behave in about the same manner in Maine as in California and the strength of reinforced concrete is about the same everywhere. If we examine the subject carefully we will find, however, that there is a wide variation in the kind of work which an engineering laboratory can do that will be most helpful to the state or locality. It will be found also that a fairly wide distribution of laboratory facilities throughout the country, to a certain extent, is very desirable.

The engineering laboratory or experiment station should serve the community in three fairly distinct ways.

First, it should serve as a local laboratory where testing facilities already are not reasonably adequate. It would seem hardly wise or proper for a college laboratory to attempt to compete with other laboratories in routine testing. But in many localities private laboratory facilities are not available, and in such cases the college should extend its facilities to the public on a proper fee basis. In many cases, also, the laboratory will be equipped to do certain special classes of testing not possible elsewhere and will have at its disposal the services of experts equipped to handle special problems better than any other agency. It is also advantageous generally for the state college laboratory to make tests for other state institutions and state commissions, such, for example, as tests of road material for highway commissions, tests of gas and electric standards for public utility commissions, and other similar work. The college laboratory should be the research laboratory for all state departments, whether or not any of the personnel of the college has an official connection with such department. The development of the engineering experiment station along these lines is quite obvious and is not greatly concerned with the question of duplication of work or equipment.

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In the second place, the engineering experiment station should develop its research work with particular reference to the industrial and engineering activities of the State. These vary widely, and while many may be similar to those of other states, the individual problems are likely to be different in some respects. It is true also that assistance often can be rendered by an institution in the same state or locality that otherwise would not be rendered at all, even though similar problems had been encountered and solved elsewhere. Dissemination of information in many cases is the thing that is needed, and the college often may be the best agent for this work. Personal acquaintance also is very helpful in many cases. The development of an experiment station along this line is a matter of slow growth. Opportunities for work of this character may not be very obvious at first, but the ultimate possibilities are large. It is in this field that valuable cooperation can be had in many cases on the part of individual establishments which may bring results of much value to an entire group of interests. The college certainly is justified in undertaking, free of charge, any line of study at the request or suggestion of any single interest if the results will be of value and may be made available to an entire group. In fact, studies undertaken free of charge for associations of manufacturers or similar bodies, are likely to prove the best kind of public service which the laboratory can perform. Work, in cooperation with various technical societies, local and national, is a fruitful field. Examples of research belonging to this category which may be mentioned, are studies made on natural resources, such as mineral deposits, clays, sands and gravel for concrete purposes, also tests of various products, especially if new or involving the use of untried materials.

But the laboratory also should serve, so far as practicable, any single private interest of the state which needs its help and which cannot readily obtain the information elsewhere. Work of this kind is not likely to be so satisfactory on the part of the college as the other classes mentioned, and requires careful regulation of fees and charges; but helping individuals helps the State and it would seem that such service is a perfectly legitimate function of the state laboratory.

The third function of the experiment station is that of general research as far as its facilities and special opportunities may warrant. But even this work can be adapted to a considerable extent to local needs and conditions. For example, a study of sewage disposal and water purification would be suitable especially for institutions located in states with congested populations, problems of hydraulics in irrigation and water power states, naval architecture in states having ship building industries, etc. Conditions in various schools also differ widely with respect to available men and means with which to conduct such research work, so that if local conditions are considered carefully in all respects there is not much danger of unwise duplication until much larger sums are available for this work than at present.

It is to be hoped that the work of engineering experiment stations will grow, and, for the best interests of all, wide publicity should be given to the results. Thus they will be of help to others in a suggestive way, for such work as may be of local interest alone, and will tend to prevent wasteful duplication in work of a more general character. It would seem that one of the most useful functions of this Association might be to serve as a sort of clearing house of ideas in engineering experimentation, and thus to promote the most helpful work along local lines, at the same time preventing unnecessary duplication of effort in the more general fields of research.

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A. MARSTON. We should take advantage of every opportunity to avoid loss of efficiency by unnecessary duplication. We should have a clearing house among ourselves in which these matters may be handled to the best advantage. The point which was made by the last speaker to the effect that engineering has been more completely established than agriculture is very interesting. That is why engineering education developed early as compared with agricultural education. But our agricultural friends have gotten ahead of us in some phases of education which are especially characteristic of our land-grant institutions, such as experiment stations and extension service lines. In these respects relative positions of agriculture and engineering have been reversed in the past twenty-five years. In extension work and experiment station work the field in engineering has been relatively undeveloped and the fact that it has been undeveloped constitutes a reason for creating an engineering experiment station in each state as rapidly as the needs arise.

A. A. POTTER. The development of the research phase of mechanic arts or engineering was delayed because of the fact that engineering research is much more expensive than agricultural research. It is very difficult to pursue engineering research with the usual equipment. All the more then is it absolutely necessary that there should be no duplication. A committee, the personnel of which is widely distributed, should study the experiments now in progress at the various state colleges and universities and send a list thereof to others, showing the fields which are being covered. Suggestions and advice would be valuable. We are in the dark as to what is being done and such a procedure would enlighten us.

F. E. TURNEAURE. Duplication should especially be avoided in general lines of work which require expensive equipment. Many of our institutions cannot afford high salaried men and expensive laboratories. But there are many things which can be done that are not expensive. For example, we have undertaken at Wisconsin the investigation of the qualities of our sands and gravels. As the state is rich in such deposits considerable help may thus be given to highway engineers and others at a very small cost. The results of such work are not of great value, say in Iowa, where conditions are quite different.

SECRETARY BISSELL. Would not the likelihood of duplication be lessened if all the institutions had channels of publication? Many of them do good work, the results of which are not available.

THE PRESIDENT. "The Relation of the Engineering Experiment Station to the College of Engineering," will be developed by C. S. Nichols of Iowa.

THE RELATION OF THE ENGINEERING EXPERIMENT STATION TO THE COLLEGE OF ENGINEERING

BY C. S. NICHOLS OF IOWA

The engineering experiment station and the college of engineering should be thoroughly coordinated. Especially along four lines should the relationship and mutual benefit be evident:

First. The station should afford opportunity for instructors to carry on research and experimentation. An engineering educator, to be successful, must grow in the profession. His value lies not alone in his knowledge of theory, but in its application to ever changing practice. Through the medium

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of persistent and systematic research, experimentation and preparation of manuscript, he will not only keep pace with engineering practice, but will also have the personal satisfaction of contributing to engineering and scientific literature something of practical value.

Second. Students should be encouraged to select thesis subjects involving the solution of local, state or national engineering problems, and to prosecute the work with system and scientific precision. Under the direction of station experts such work would prove of value to students as training in real experimentation, and very often might result in theses of such technical value as to warrant their publication. Much preliminary. work could be accomplished for the station by assigning different phases of an investigation as thesis subjects.

Third. Data resulting from special research, investigations, tests and analyses or compilation, should be supplied to faculty and students alike. Station bulletins often constitute a very important part of an engineer's library. Frequently they serve as valuable supplements to engineering college textbooks

Fourth. The station should constitute definitely organized department of the college of engineering for prompt and systematic public service work. State supported institutions will always be expected to, and should, as far as possible, make direct, as well as indirect, returns to their constituency, through assistance rendered individuals, the mining, manufacturing, transportation and other industries, and to municipal, county and state governments. Into this work, properly governed to prevent its invasion of the private engineering field, would enter any of the trained experts of the college of engineering as demand therefor arose. Thus there would be a special department operating to furnish expert assistance along any branch of engineering or industrial activity, the object being to bring about a greater industrial progress and a higher plane of living.

G. W. Bissell. "Great oaks from little acorns grow." May I tell you about the Iowa acorn? Some twenty or more years ago I was a colleague of Dean Marston and of equally choice spirits who were thoroughly imbued with the research idea. We desired that the world should benefit by our work. We lacked the necessary soil and water to make the acorn grow, but, nevertheless, we grew it. We bought apparatus from the regular departmental appropriation, using such sums of money as we could persuade the watchdog of the treasury to release. Our first channel of publication was a private venture, a monthly publication known as the "Iowa Engineer". Four members of the engineering faculty jointly edited and published it at their own risk. It paid its way, mainly by the advertisements it secured, although there was a small subscription list of alumni and others. Finally the work attracted the attention of the college authorities and they allotted to it a few hundred dollars. I am personally gratified to see how large and glorious an oak has grown from the acorn we planted many years ago.

On motion, a recess was taken until 2 P. M.

Afternoon Session, Thursday, August 12, 1915

The Association was called to order at 2 P. M. by the President.

The President. Dean O. V. P. Stout of Nebraska will draw "Lessons from the Experience of the Agricultural Experiment Stations."

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Lessons to be Drawn from the Experience of the Agricultural Experiment Stations

By O. V. P. Stout

The experience of the agricultural experiment stations in this country has resulted in the evolution of some very definite ideas as to their functions, relations, organization, policy and procedure. These ideas have been given expression most authoritatively in the publications of the Office of Experiment Stations of the United States Department of Agriculture, including the reports of committees of the Association of American Agricultural Colleges and Experiment Stations. It is the purpose of this paper to review some of these expressions and to consider how far they may apply in connection with engineering experiment stations organized or to be organized in the land-grant colleges.

The discussion from the first must take account of some fundamental differences in conditions. One of the chief of these is that at present the engineering stations must depend wholly upon state appropriations for support, and upon state and institutional authority for supervision. Another is that in agriculture the stations practically have their field entirely to themselves, whereas in engineering it is quite largely occupied by other agencies, both public and private. A third difference is based on the fact that organization in the two industries is not the same, the units in agriculture being so much smaller in size and so much greater in number than in engineering. Finally, and in large measure as a result of the conditions already noted, the occasion for the establishment of an engineering station may be merely the proper utilization of a byproduct in the form of research results, whereas in agriculture the station in its present status has its own independent and separate purpose.

The agricultural experiment station is a natural outgrowth of the college. Prior to the passage of the Land-Grant Act in 1862 there were a few agricultural colleges in the United States, and some experimentation in agriculture was carried on both by public and private agencies of investigation. Considering the length of time which had elapsed since the formation of the Union, progress had been slow and results meager. The establishment of the land-grant colleges called to the work of agricultural instruction a body of men who thereby were exposed to the influences which lead the teacher to approach the field of investigation. As a result, experimental work, carried on under varying degrees of system and organization, became early an attendant feature of the colleges. The promotion of the establishment of agricultural experiment stations was the object of a convention of delegates from the agricultural colleges which met in Washington in 1883. By the time that the Hatch bill was before Congress in 1886, about seventeen of the states, either through the medium of regularly organized experiment stations or otherwise, were engaged systematically in the work of agricultural experimentation.

In view of the fact that mechanic arts was emphasized equally with agriculture in the Land-Grant Act, it must occur to us to inquire why an impulse for the creation of engineering experiment stations was not developed contemporaneously with that which led to the establishment of those devoted to agriculture. The extent to which the exact sciences—mathematics and mechanics—underlie engineering will go far to explain this. The field was open at that time for a large amount of investigation requiring only abstract

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reasoning on the basis of some of the fundamental laws of physics which had been established early and a minimum of new observational data. The majority of early teachers of engineering who felt moved to enrich the field therefore were able to occupy themselves along these lines. The necessity and desire for publication and record of results, which figured as a motive in the establishment of the agricultural stations, was met largely in engineering by the facilities afforded by technical periodicals and society proceedings.

Among the many developments which may be cited as contributing to the emergence of the engineering experiment station propaganda, it seems that none can be more completely basic and comprehensive than the idea, which has come to us chiefly through the experience of the agricultural divisions, that research within the division is a vitalizing element, influencing not only the interior work but the relations with the public.

Research is the primary purpose of the agricultural experiment stations. Although the language of the Hatch Act is capable of this interpretation, and, doubtless, it would have been admitted from the first, it is only through having to contend for it that it has become established clearly as a guiding principle. The passage of the Adams Act in 1906 was prompted by the fact that expenditures from the Hatch fund for attendant features of station work, such as administration and the diffusion of knowledge, as permitted under the terms of that act and as in large degree demanded by conditions at the stations, and the absorption of state appropriations by purchases of land, construction of buildings and in various state activities assigned to the stations, left too small a residue for the proper conduct of the primary work of research. Occasion was therefore taken in framing the Adams Act to provide for regulating the expenditure thereunder and to restrict it to the purpose of "paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States." In the administration of this fund by the Office of Experiment Stations, and with the generally cordial cooperation of the stations, emphasis has accrued to research, and the ideal in that respect has taken fairly definite shape and is held persistently to view.

Some of the recognized obstacles to the progress of the stations toward the desired status have been enumerated and serve fairly to indicate that status. In 1906, the committee on station organization and policy of the Association of American Agricultural Colleges and Experiment Stations sensed the chief difficulties of that time as follows: " (1) a lack of clear discrimination between investigation in a strict sense and ordinary experimental work; (2) a lack of definiteness in the purpose and plan of the investigations; (3) a tendency to take up too large or broad problems; and (4) the outlining of too large a number of projects." The situation was characterised as presenting "indications of a certain unreadiness for research of the true type", and it was further noted that "many of our station workers see only the immediate duty of the station to the local farmer of today. They forget that the station has a duty to all phases of agriculture in a broad sense, in order that its labors may lead to much more permanent and widespread benefit."

Equally important with the proper conception of the primary purpose for which the stations exist is the realization of the conditions essential to the carrying out of that purpose.

Some of the problems of research must be attacked simultaneously from different quarters, and require the concurrent services of specialists in different lines. A good instance of this is the work undertaken a few years ago by the Utah station, directed to a study of the various effects of irrigation water

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applied to crops at different times and in varying amounts. This required the enlistment of several departments of the station, including chemists, agronomists and engineers, followed by a final analysis from the standpoint of the economist. Also, the work of any single station and of the stations as a whole must be correlated to the end of avoiding unnecessary duplication as well as unbalanced research, and to insure cumulative results and continued advance. From these and similar considerations it is evident that organization and therefore administration are necessary. Mere organization, without an active follow-up in the way of administration, will be inert.

The committee on station organization and policy of the Association of American Agricultural Colleges and Experiment Stations has reviewed quite thoroughly the question of the relation of administration to research, with conclusions substantially as follows. The field of each station worker should be defined accurately, and in his investigations within that field he should be protected and funds and equipment provided sufficient to the ends. "The less administration the better, if only proper ends are attained; but workers must recognize the necessity of organization and therefore of administration." In dealing even with mature and qualified workers the administration should be qualified to judge of the value or necessity of proposed work, its relation to other work, and of the adequacy of available funds, equipment and time. The work once having been planned and authorized, the worker should not be interfered with until results are due. These required results, however, may be in the nature of progress reports to be checked against the schedule which was formulated when the work was planned. "A good station and a good director generally go together."[1]

Continuity of station work is essential, but is one of the most difficult objects to attain. It is opposed by too frequent changes in working force, dropping work to meet actual or supposed clamor for other lines, work undertaken without complete assurance that facilities can be provided, government by the station staff rather than by the director, amount of teaching and extension work required of station officers, and by undertaking too many lines of work. "Money spent on discontinued or interrupted projects usually is very largely wasted." In a recent report of the Office of Experiment Stations it is noted that a better understanding of the time element in investigation has been reached. Even the public is less inclined than formerly to press unduly for the answers to problems which are under investigation. This, in facilitating sound progress, should contribute to continuity as well.

That research requires favorable conditions for the worker has become an established principle with the directing agencies in station work. From the commencement of the planning of a research project to the final interpretation and analysis, the proceeding is a thoughtful one. Undue and unseasonable interruption or interference of any kind is distracting to the worker and disorganizing in its effect upon the project. In the statements of policy for station work repeated emphasis is put upon the elimination or minimizing of distracting influences. The chief of such influences are related to the work of instruction, interior and exterior. It has been recommended as "an ideal policy, to be adopted as rapidly as the conditions of the various stations will permit, that those charged with research be completely freed from all responsibility for routine class-room teaching; and that as a step in this direction the teaching required of the investigator be limited to a

[1] U. S. Dept. Agr., Off. Exp. Stas., Rpt. for 1913.

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maximum of three hours per week during one semester annually, to be given along the line of his speciality.".[1] It is quite generally true that the capable scientific investigator is one who enjoys association with qualified and appreciative learners in his field. Added to this is the fact that the students cannot be kept away from him if he is a good man in his line. A fair interpretation of the strictures which have been drawn seems to be that while one charged with the conduct of a research project should have no formal or class-room teaching to do, the regulation should not extend to informal and incidental instruction of college students, so long as it is not carried to that excess which in the nature of the case is improbable. Considering for the moment the interest of the teaching branch, there is unanimous agreement to the effect that participation in research work conduces to effective teaching, so long as it does not become too engrossing, and for this reason the teachers should be afforded the closest possible contact with the research work. This can be done to good effect without charging them heavily with responsibility for investigation.

As the agricultural experiment stations reached the point where their results had been incorporated into practice with favorable effect, and dependence upon them for solution of problems affecting practice had accrued, the contact of the workers with the public through correspondence, conference and lecture engagements increased greatly. Up to a certain, or perhaps to an uncertain, point this contract was stimulating and redounded unqualifiedly to the good of the station work. The time arrived however, several years ago, when the demands of this sort upon the time and strength of investigators drew them too much aside from productive labors. At the same time the research work, feeding in a sense upon itself, expanded and became more exacting. The work of college instruction, also, as has been noted, came to be looked upon distinctly as an interference. This situation has led to the differentiation of the agricultural divisions into the three branches of organization, namely: station, interior teaching and extension, each one manned principally by those whose primary duty is to their own branch. The proper relations which the experiment station and its workers should bear to the new branch of extension has been given consideration, with the result that a scheme of organization and policy is fairly discernible; being, however, much more definite in respect to some points than to others. As in the relation to interior instruction, the station worker is to be guarded and not burdened with schedule or other duties in extension which may affect his station assignments; but the principle that "the experiment station is for the acquisition of new knowledge and the extension service for dissemination is not to be construed too literally or narrowly."[2]

More or less work of a regulatory nature,—such, for instance, as fertiliser inspection and control—has been assigned to the stations in the various states, either directly or indirectly through legislative designation of members of the staff. Independently of whether it is desirable from the standpoint of the stations to eliminate this work, it is not practicable at once to do so. In deflecting and distracting station workers of course it may be fully as objectionable as the other non-research activities which have been discussed; and the remedy, where the situation demands a remedy, must be the same: separate organisation and support. Work of the same nature tends in some states to attach itself to the engineering divisions also. The extent to which

[1] U. S. Dept. Agr., Off. Exp. Stas., Circ., 82. [Rpt. Com. Sta. Org. and Pol., Assoc. Amer. Ag'l Coll. Exp. Sta.] (1908).

[2] U. S. Dept. Agr., Off. Exp. Stas., Rpt. for 1913, p. 49.

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it will do so, however, is largely within the control of the institution. My own somewhat tentative idea is that the engineering divisions should be active in instituting state activities of which they may be presumed to have the best conception, and that where it seems necessary or advisable to do so, they should carry the burden of these through the organization and preliminary stages. But I doubt the wisdom of taking on any such work as a permanent obligation.

Station work competes with the interior teaching and extension branches of an institution not only for the services of men but also for the appreciation and support of the public. Now that the lines are drawn quite clearly, the stations are realising that a large part of the popular appreciation which they had enjoyed, especially that which was local, accrued to them through their extension activities and will tend to follow the extension branch. The public cannot be depended upon to exercise a wise discrimination in such a matter and is prone to attach its favor to the dispenser rather than the producer of benefits. Moreover, the Smith-Lever Act demands, as a condition precedent to the apportionment of government money for extension, that the State in each case shall contribute funds in equal amount. It must appear, therefore, to the legislatures that for each dollar that they appropriate for agricultural extension two will become available, while an appropriation for research makes available only the amount of the same. So far as federal appropriations of the nature of the Hatch, Adams and Smith-Lever Acts are concerned, we have in engineering practically a clean sheet to work upon. The lesson to be drawn from the agricultural field seems to be manifestly to the effect that the movement for government support should be directed in behalf of research, to the present exclusion of the other branches, and with the aim of inducing the government to make provision on a scale which will meet practically the entire need of support for engineering research in the land-grant colleges. The other branches, especially extension, can depend with greater assurance upon the respective states in each case.

From the discussions it appears, in part explicitly and in part by inference, that there are important respects in which station policy as to development may differ from that which attaches to the teaching organization. It is pointed out that the requirement for symmetry in development does not rest upon research with the same insistence as upon instruction, and that a more effective station results from a few strong departments than from a larger number of inferior ones. The argument seems to point to the principle that in station work the concentration of support upon the strong departments and upon those in which there are possibilities of strength is justifiable and proper; and that each station should be permitted and encouraged to do chiefly that which, in view of the qualifications of its staff and the nature of local facilities, it is best fitted to do, to the end that the sum total of results from all of the stations may conduce most effectively to the establishment of a strong foundation in fact and principle for the industry as a whole. There are conditions at every station which tend to this accentuation of certain lines of research, and this will be equally true in engineering. It is important to consider whether the concentration shall come as a more or less reluctant yielding to local conditions of whatever nature, or in larger degree and as a deliberate policy directed to the recognition of those conditions and looking upon them as indicating the best opportunities for service to the industry and enhancement of the reputation of the station.

There seems to have been relatively little discussion of form of organization as distinguished from principles of administration. Probably thie

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is because the principles of administration as established by experience and discussion point the way to organization so clearly that it has followed as a matter of course. So far as appears, the evolution has been direct and the organization of all agricultural divisions has been at all times essentially the same in type, apparent variations being explainable as representing different stages of progress toward expansion of a single type. That type in its complete or ultimate form may be assumed to be that which has been set forth as follows:

"The work of the college as a whole should naturally be divided according to the subject matter into departments, such as those of agronomy, animal husbandry, dairying, horticulture, etc. Since it is highly important that the information on any subject given to the student and the public, should represent the views of the institution as a whole, all the experimenters, teachers, and extension workers should be grouped by departments. Thus the department of agronomy should embrace all the agronomists employed by the college, whether they are engaged in experimenting, teaching, or extension work.

"Each department will naturally be presided over by a head professor, who will have authority to assemble all workers in his line for consultation regarding the subject matter of their work, methods of instruction etc. All the workers will be expected to keep in close touch with their respective departments, so as to be fully acquainted with their work and the progress of knowledge in those lines. On the other hand, each member of a department will be a member of the experiment station, the college instruction force, or the extension division, and in some cases will take part in the work of more than one branch. * * *

"To carry out such an organization several classes of administrative officers are required. The college of agriculture, including its research, interior teaching, and extension work, will be in charge of a dean. Under this dean will be three directors, (1) of the experiment station, (2) teaching division, and (3) extension division. Each of these directors will have administrative control of his division and of the men assigned to it as far as the program for the employment of their time and assignment to duties is concerned. Where the work and staffs of the divisions overlap or cooperation is desirable, the three directors should form an administrative committee under the chairmanship of the dean."[1]

Since the organization of the engineering divisions, so far as they have progressed, is similar to that of the agricultural divisions, it is not unreasonable to expect that the form which has been adjudged appropriate for the full growth of the one will serve likewise the purposes of the other.

Mention has been made of publication and record as one of the chief ends to be served by the organization of experiment stations. The experience in this respect is as instructive as that along the lines which have been discussed, since it covers conditions which in the nature of the case will be duplicated in the engineering field.

Previous to the establishment of the experiment stations the results of agricultural investigations in the land-grant colleges were not assured of publication. They were liable to be lost or destroyed or buried in department files. The stations began by publishing bulletins without classification of any sort. A single publication would set forth the methods and results of a piece of research work, and within the same covers it would undertake to point out to the farmer the practical applications. The methods would be

[1] U. S. Dept. Agr., Off. Exp. Stas., Rpt. for 1912, pp. 48-49.

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described for the benefit or information of the scientific worker and those whose knowledge and training might qualify them to weigh the conclusions in the light of the evidence adduced. This type of bulletin has been found to give rise to impatience on the part of both classes of readers. The scientific reader resents the style and much of the subject matter of the pages which he must examine to extract that which is of interest to him. The farmer or the non-scientific reader, unaccustomed as he is to a discriminating and selective examination of literature of any sort, concludes that because there is so much that he does not understand, the entire work is of a theoretical and impractical nature. Realizing the condition, and in order to adapt their publications better to the convenience and understanding of their readers, and also as a measure of economy resulting from a reduced volume of the popular bulletins and reduced circulation of the more scientifically written ones, many of the stations have adopted the expedient of publishing a series of technical bulletins designed for the scientific reader, and of excluding severely technical matter from the bulletins intended for general circulation. Even this has not been found to meet fully the needs of the situation, and about two years ago, the United States Department of Agriculture, pursuant to a recommendation made by the Executive Committee of the Association of American Agricultural Colleges and Experiment Stations, after conference with the Secretary of Agriculture, undertook the publication of "The Journal of Agricultural Research." It was considered that this undertaking was justified by the considerations which appear substantially in the following paragraphs.

Its files will facilitate the task of the research worker in informing himself as to the work already done contributing toward a solution of his problems. The information will be more readily accessible and will require less sifting than that which is scattered through a multitude of pamphlets from a large number of stations.

Statements of work in progress are desirable more frequently than they appear. The Journal may supplement and to some extent supplant the stations in the publication of such material.

Minor and byproduct items of research work, not adapted to publication in separate bulletins nor closely enough related to the subject matter of larger bulletins to justify their inclusion therein, may be published in such a journal.

The files of a dignified journal are more nearly insured of preservation by both public and private agencies than are the miscellaneous bulletins of the stations.

As presenting a general survey of the field of research in agriculture, "The Journal of Agricultural Research" must be more effective than the station bulletins.

It is claimed also, that the Journal is superior to the station publications in bringing the attainments and capacities of station workers to the knowledge of that portion of the world at large which may be able to appreciate and in various ways to reward the same. This result not only is one to which the station workers are entitled, but one to which the world, appreciative of the knowledge conveyed, also is entitled.

The Experiment Station Record, now in its thirty-second volume, is a monthly publication issued by the Office of Experiment Stations. It furnishes a classified index and a brief review note of all publications of interest to workers in the agricultural divisions, which have come to the knowl-

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edge of the editors. This is its main feature and justification, although it contains also editorials and news notes.

If it may be assumed that the engineering experiment stations are to receive federal support and come under federal supervision after the manner of the agricultural experiment stations, it seems that, just as in the case of organisation, the engineering divisions may accept as ready made the scheme of publication now operative in agriculture. However, there will be some differences in scale and proportion.

A relatively large number of the bulletins issuing from engineering experiment stations and embodying the results of research therein will be technical bulletins which cannot be read completely by others than engineers or scientists. In the industries the results of research are not taken up directly by the individual workers, but by the technical heads of the organisations, whose province it is to train and direct the workers in the practical applications. In some of the fields, notably in sanitary engineering, in which I believe it is admitted that all workers must be teachers and advocates as well, a series of popular bulletins will be appropriate. Bulletins which present the results of investigation and analyses of conditions of production and bargaining in the industries also will be of a semi-popular type at least. Even in these, however, it will appear quite often that the publication should issue from the extension rather than the research branch of the division.

In view of the large number of established and reputable engineering periodicals, and of the regularly published proceedings of engineering societies, the files of all of these being found in fairly complete form in libraries widely distributed over the country, and especially in the colleges, a doubt may arise as to whether there will be full justification for a periodical corresponding in its nature and uses to the Journal of Agricultural Research. There is at present in this country no publication which might be called a Journal of Engineering Research. Is it not possible that such a journal might contribute materially to the elevation of the engineering profession, not only absolutely but in the estimation both of the scientific and the industrial or practical world?

The experience of the stations in their exterior relations is a subject which will repay study by the engineering divisions. It will be found that there are possibilities of friction and antagonism in these relations. Any single station may find itself arrayed in respect to policy or action against either its own governing board, its constituent public, the federal supervising agency, the combined sense of the Association of American Agricultural Colleges and Experiment Stations, or against two or more of these at the same time. The very fact, however, that there are so many of these elements in the situation and that the inter-connections have come to be such that each may be influenced by the others, tends to make harmony more secure, to insure a just and rightful issue of differences, and to give forceful backing to propositions of merit.

Until federal appropriations for the engineering experiment stations are obtained, with the accompanying governmental supervision, only a few of them will be able to operate under the conditions which the experience in agriculture indicates as essential to the full quality and effect of their work. Many of them must proceed on a basis very much the same as that of a majority of the agricultural stations in their beginnings. The station in such case will depend for its justification upon the extent to which added system and direction improves the quality and adaptability of the research work, upon

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the assurance that the results will be made accessible through publication, and upon the development of a nucleus of organisation which can be expanded into a full coordinate branch when the necessary financial support becomes available.

A. MARSTON. The Iowa engineering faculty engages in college instruction work, engineering research work, and engineering extension work, and a few members conduct some instructive work of sub-collegiate grade. The dean of the division of engineering is also director of the engineering experiment station. Some of the station men devote full time to research work, and some of the regular instructional staff devote more or less time to experimental work, receiving from $100 to $1,000 annually on a divided salary basis. Some members of the instructional staff do some experimental work without remuneration. The several lines of work are carried on in different buildings. As a result of this inchoate condition it is hard to handle the station efficiently and systematically. The last speaker, himself a busy man, has been very helpful in coordinating and systemising these lines of work.

Our work is handled on the project plan. Blanks are submitted containing advance estimates of time and cost. Each project is given a number, and in all future records is referred to by that number. Some of these projects may be in hand for five or more years, and others only a few months. All correspondence passes through the central office, so that we avoid so far as may be the danger of loss of partially completed work. Before the work was thoroughly organized materials sent in per lists were often delivered to wrong departments. All materials which come to the experiment station are now delivered at one place, whence they are redelivered to the proper department.

THE PRESIDENT. We are honored by a message from the college section of the Association of American Agricultural Colleges and Experiment Stations, and particularly honored in that its bearer is President of that Association.

E. A. BRYAN of Washington. Some of you will recall that proposed amendments to the Constitution of the Association of American Agricultural Colleges and Experiment Stations were discussed at the convention in Washington in November, 1914. No very satisfactory conclusion was secured. However, in the midst of the discussion a motion was made authorising the college section of the Association to establish a division of engineering. That section has just established such a division. All the delegates of the Land-Grant College Engineering Association who are interested are cordially invited to participate in the formation and operation of such a division. The committee of notification, speaking for the college section, sincerely hopes that you will take the necessary steps to form such a division. I may add that, of course, the papers and discussions of such a division will form a part of the Proceedings of the Convention of the Association of American Agricultural College and Experiment Stations.

THE PRESIDENT. "The Engineering Experiment Station Problem at the University of Nevada" will be discussed by Dean J. G. Scrugham of Nevada.

J. G. SCRUGHAM of Nevada. In most of the western states, the foremost engineering problem is the development and conservation of water for the reclamation of arid lands. The United States Reclamation Service and private capital have accomplished much toward the solution of the problem in the way of construction of large irrigation enterprises, but the small unit has received but little attention. Herein lies an excellent opportunity for engineering experiment stations, such as we have at Nevada, to perform

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a great public service. About $10,000 are now available yearly which we are devoting to the development of underground waters.

Another promising field lies in the development of electro-chemical and metallurgical processes for better utilization of our natural resources. Most of the mountain states have water powers that lie dormant for lack of market, and unworked beds of alkalies and ores for which no satisfactory refining processes are available. In Nevada alone we use annually considerably over a million dollars worth of imported cyanide, and at the present time an adequate supply to keep the mills in operation is not at all assured. There are numerous other products for which American industrial processes should be developed as soon as possible.

With the object lesson of German industrial efficiency in the public mind, the present appears to be the psychological moment to press our demand for funds to carry on industrial experimental work. We can easily convince ourselves of the desirability of such financial assistance, but our great problem is to create the pressure necessary to force the appropriation bill through Congress. It is hard to realize the tremendous inertia to be overcome and the broad extent of the educational campaign which lies before us. The veterans who piloted the Hatch, Adams and similar acts into safe harbor, can give us many valuable pointers on political procedure. We should first secure the unqualified endorsement of the great national engineering societies. They should appoint sub-committees to confer with our executive board as to the most efficient methods of conducting our propaganda. Then we should secure the active support of the great industrial, labor and other organizations. Then each state should have its engineers and industries organized to bring pressure to bear on its congressional delegation. This probably means that if we are to achieve success, the dean of the land-grant engineering college will have to bear the brunt of the grinding work.

The criticism will immediately arise that there will be a wasteful duplication of work in the numerous stations to be created. This can be met by providing for federal supervision. The Federal Bureaus of Rural Engineering, Standards and Mines are all doing work of this character. I deem it very necessary to secure their support and cooperation. They must be shown that we will not infringe on their perogatives and that the state engineering experiment stations will strengthen their work. A practicable system of cooperation must be devised in which the right of the state to select its projects will be recognized.

A lack of clear understanding of the relative functions of the supervising federal bureau and the director of the state engineering experiment station may prove a fruitful source of discord. We must remember the complications arising from the fact that the three federal bureaus mentioned are under the jurisdiction of three separate federal departments. Broadly speaking, I think that we can consistently urge our engineering experiment station bill as a "preparedness-for-war" measure, as it seeks to increase industrial efficiency.

In conclusion, I wish to suggest that a brief embodying the advantages of a system of state engineering experiment stations, be presented to the members of the recently appointed Naval Advisory Board for consideration. The services of a corps of engineering experts trained in such stations would certainly prove a governmental asset in time of war which would incidentally emphasize the fundamental importance of the engineering profession.

F. A. THOMSON. The history of the various attempts which have been made to secure federal grants in support of mining schools is pertinent. We

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do not know why these have proven abortive. However, it is significant that neither the Bureaus of Standards nor of Mines supported the measures.

J. G. SCRUGHAM. Some of us cannot help but feel that to lack of organized effort and of propaganda, both of which are necessary, may be ascribed the failure of these bills.

E. F. CODDINGTON of Ohio. We have had to deal with this matter at the Ohio State University. We regard it as a vital issue. A committee has been appointed to find out how to improve conditions, and, after a year's study, we are of the opinion that if conditions are to be improved it must be through a correlation of subjects. We are not clear, however, as to how to bring this about. We are wondering if a different organization might not accomplish that end more easily than our existing organization. Our university is divided into colleges, but the real unit is the department. This organization does not give the college officers any control over the departments. Now if we are to have correlation it will be brought about simply by diplomacy, by getting the different departments together. This may be easily done with most of the departments, but a few do not appreciate that such a problem exists. Might we not bring it about more effectively if we had our college organization as a unit?

A. A. POTTER. As a method of correlation of the various courses in engineering, I believe that a department of experimental engineering is unfortunate. We have had experience at Kansas with such a department where all the laboratory work in engineering was supposed to be given. This has resulted in considerable duplication of the technical instruction and in lack of correlation between the class room and laboratory instruction. The laboratory course should be given by the department which teaches the theoretical courses of hydraulics, electricity, strength of materials, heat engineering, etc. Separation necessitates the introduction of special work and results are apt to be unsatisfactory.

Agricultural engineering subjects should be taught by the engineering division and not in the department of agronomy or other unit of the college of agriculture. For many years a teacher supposed to be a specialist in all branches of engineering, including farm machinery, irrigation, surveying, heat engines, rural architecture, etc., gave instruction at the Kansas college in all these subjects with very unsatisfactory results. During the past two years the engineering division has given this instruction and the results are very gratifying.

F. E. TURNEAURE. I have studied the question of correlation for many years. I suppose the easiest method of correlating the work, so far as the student is concerned, is to have a close organization for all the instruction given in civil engineering and a similar organization for the work in mechanical engineering, and so on, each department having its own laboratory and thus being practically independent of the others. Now that is the method followed in a few institutions and the work is very well organized from the standpoint of the student and course of study. However, this method leads to much duplication. At the other extreme is the scheme whereby all the instruction in a given subject is offered by a single department to any student who wants instruction in that subject. From the standpoint of the teacher that would seem to be the most effective arrangement, and in fact is about the arrangement we have in operation. It brings up, however, the question of the correlation of studies from the standpoint of the student and the course which he is pursuing. It has been our experience that it is not desirable or necessary to create any additional machinery for this purpose other than

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conference committees and that the best results are obtained by the continuous operation of such committees covering the various departments of instruction which are interested in a particular group of students. As a result of frequent and rather informal conferences of these committees, and with a proper spirit of cooperation, which is not very difficult to secure from the different departments, it seems to us that we get adequate correlation of studies so as to make conditions satisfactory to the students and at the same time, to secure economy and solidarity of instruction.

G. A. COVELL of Oregon. We have found the plan mentioned by Dean Turneaure to apply very successfully in our work. Individual conferences between the interested departments are no doubt the best means of securing good results. We are sure that we can handle our laboratory work more economically as well as very satisfactorily under one general head, although we have not been entirely free from the difficulties suggested by Dean Potter.

On motion, a recess was taken until eleven A. M., Friday, August 13.

MORNING SESSION, FRIDAY, AUGUST 13, 1915*

The Convention was called to order at 11 A. M. by the President.

On motion, the details of the merger of the Land-Grant College Engineering Association with the college section of the Association of American Agricultural Colleges and Experiment Stations, and the question of continuing the Land-Grant College Engineering Association as a separate organization, were referred to the Executive Committee with power.

On motion, the report of the nominating committee was accepted and the following officers elected by ballot: President, G. W. Bissell of Iowa; Vice-Presidents, J. G. Scrugham of Nevada; W. M. Riggs of South Carolina; P. P. Claxton, *ex officio* of Washington, D. C.; Secretary-Treasurer, A. A. Potter of Kansas; Executive Committee, the above named officers and F. E. Turneaure of Wisconsin; C. R. Jones of West Virginia; A. A. Titsworth of New Jersey.

On motion a recess was taken until 2 P. M.

AFTERNOON SESSION, FRIDAY, AUGUST 13, 1915

The Convention was called to order at 2 P. M. by the President, meeting in joint session with the college section of the Association of American Agricultural Colleges and Experiment Stations. (For proceedings, see pages 168 to 178 of this volume.)

On motion, the Convention adjourned, *sine die*.

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*The Association met in joint session with the Association of American Agricultural Colleges and Experiment Stations in order to listen to address by Senator F. G. Newlands on Federal Aid to Engineering Experiment Stations. (pages 146-150)

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PROCEEDINGS

OF THE

THIRTIETH ANNUAL CONVENTION

OF THE

Association of American Agricultural Colleges and Experiment Stations

HELD AT

WASHINGTON, D. C., NOVEMBER 15-17, 1916

Edited by J. L. HILLS, Secretary
For the Executive Committee of the Association

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The Land-Grant Colleges, Agricultural Experiment Stations and Agricultural Extension Services

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AGRICULTURAL AND MECHANICAL COLLEGE FOR NEGROES, *Normal.* W. S. Buchanan, *President.*

TUSKEGEE NORMAL AND INDUSTRIAL INSTITUTE, *Tuskegee Institute.* R. R. Moton, *Principal;* G. W. Carver, *Director Experiment Station;* G. R. Bridgeforth, *Director Agricultural Department.*

CANEBRAKE AGRICULTURAL EXPERIMENT STATION, *Uniontown.* L. H. Moore, *Director.*

ALASKA—ALASKA AGRICULTURAL EXPERIMENT STATIONS, *Sitka, Kodiak, Rampart, and Fairbanks.* C. C. Georgeson, *Agronomist in Charge (Sitka).*

ARIZONA—UNIVERSITY OF ARIZONA, *Tucson.* R. B. von KleinSmid, *President;* R. H. Forbes, *Dean College of Agriculture, Director Experiment Station;* E. P. Taylor, *Superintendent Agricultural Extension Service;* G. M. Butler, *Dean College of Mines and Engineering;* DeRossette Thomas, *Assistant Professor of Home Economics.*

ARKANSAS—UNIVERSITY OF ARKANSAS, *Fayetteville.* J. C. Futrall, *President;* M. Nelson, *Dean College of Agriculture, Director Experiment Station;* W. C. Lassetter, *Acting Director of Extension Work;* W. N. Gladson, *Dean College of Engineering;* Ruth A. Peck, *Instructor in charge Home Economics.*

BRANCH NORMAL COLLEGE, *Pine Bluff.* J. G. Ish, Jr., *Superintendent.*

CALIFORNIA—UNIVERSITY OF CALIFORNIA, *Berkeley.* B. I. Wheeler, *President;* T. F. Hunt, *Dean College of Agriculture, Director Experiment Station;* W. T. Clarke, *Professor Agricultural Extension;* C. L. Cory, *Dean College of Mechanics;* Jessica Peixotto, *Chairman of Study List Committee on Home Economics.*

COLORADO—THE STATE AGRICULTURAL COLLEGE OF COLORADO, *Fort Collins.* C. A. Lory, *President;* C. P. Gillette, *Director Experiment Station;* H. T. French, *Director Extension Service;* Charlotte E. Carpenter, *Acting Head Department of Home Economics.*

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EXPERIMENT STATION OF THE HAWAIIAN SUGAR PLANTERS' ASSOCIATION, *Honolulu.* H. P. Agee, *Director.*

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PORTO RICO AGRICULTURAL EXPERIMENT STATION, *Mayaguez.* D. W. May, *Agronomist in Charge.*

PORTO RICO INSULAR EXPERIMENT STATION, *Rio Piedras.* W. V. Tower, *Director.*

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THE HAMPTON NORMAL AND AGRICULTURAL INSTITUTE, *Hampton.* H. B. Frissell, *Principal;* C. K. Graham, *Director Agricultural Department and Extension Work.*

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THE WEST VIRGINIA COLLEGIATE INSTITUTE, *Institute.* B. Prillerman, *President;* A. W. Curtis, *Director Agricultural Department.*

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Turneaure, *Dean College of Engineering;* Abby L. Marlatt, *Director of Home Economics.*

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List of Delegates and Visitors in Attendance

ALABAMA: C. C. Thach, J. F. Duggar, delegates.

ARKANSAS: J. C. Futrall, Martin Nelson, W. N. Gladson, W. C. Lassetter, delegates; C. W. Watson, visitor.

CALIFORNIA: J. W. Gilmore, C. F. Shaw, C. L. Cory, H. E. Van Norman, delegates; Mrs. C. L. Cory, Mrs. H. E. Van Norman, visitors.

COLORADO: C. A. Lory, C. P. Gillette, H. T. French, G. E. Morton, delegates; Mrs. C. A. Lory, visitor.

CONNECTICUT: C. L. Beach, E. H. Jenkins, H. J. Baker, Maud E. Hayes, delegates; W. L. Slate, Jr., visitor.

DELAWARE: Harry Hayward, delegate; Myrtle V. Caudell, visitor.

FLORIDA: A. A. Murphree, P. H. Rolfs, A. P. Spencer, delegates; Edward Conradi, Agnes E. Harris, C. K. McQuarrie, visitors.

GEORGIA: A. M. Soule, H. P. Stuckey, J. P. Campbell, P. V. Ewing, delegates; L. B. Mogid, visitor.

IDAHO: M. A. Brannon, J. S. Jones, delegates.

ILLINOIS: David Kinley, E. Davenport, W. F. M. Goss, Isabel Bevier, delegates; H. G. Bell, A. J. R. Curtis, Robert Stewart, B. von Herff, visitors.

INDIANA: W. E. Stone, Arthur Goss, J. H. Skinner, G. I. Christie, delegates.

IOWA: R. A. Pearson, C. F. Curtiss, R. K. Bliss, A. Marston, delegates; Catharine J. MacKay, W. H. Stevenson, visitors.

KANSAS: H. J. Waters, W. M. Jardine, A. A. Potter, delegates.

KENTUCKY: J. K. Patterson, George Roberts, A. M. Peter, Mary E. Sweeny, delegates; R. M. Allen, R. W. James, W. K. Patterson, visitors.

LOUISIANA: T. D. Boyd, W. R. Dodson, J. A. Redhead, delegates; L. E. Perrin, C. E. Woolman, visitors.

MAINE: R. J. Aley, C. D. Woods, H. S. Boardman, delegates; B. S. Brown, P. W. Monohon, Mrs. C. D. Woods, visitors.

MARYLAND: H. J. Patterson, T. H. Taliaferro, Harry Gwinner, delegates; I. W. Huntzberger, H. B. McDonnell, visitors.

MASSACHUSETTS: K. L. Butterfield, W. P. Brooks, W. D. Hurd, H. W. Tyler, J. B. Paige, delegates; W. J. Beal, Laura Comstock, J. A. Foord, Mrs. W. D. Hurd, W. C. Jewett, Earl Jones, S. R. Parker, F. W. Rane, Mrs. F. W. Rane, L. C. Seelye, R. W. Stimson, H. J. Wheeler, visitors.

MICHIGAN: F. S. Kedzie, R. S. Shaw, R. J. Baldwin, G. W. Bissell, A. M. Brown, Georgia L. White, delegates; C. P. Cook, M. M. McCool, E. Mumford, Mrs. E. Mumford, V. M. Shoesmith, L. R. Taft, visitors.

MINNESOTA: A. F. Woods, E. M. Freeman, R. W. Thatcher, A. D. Wilson, Josephine T. Berry, C. G. Selvig, A. V. Storm, delegates.

MISSISSIPPI: W. H. Smith, E. R. Lloyd, delegates.

MISSOURI: A. R. Hill, F. B. Mumford, A. J. Meyer, delegates; W. W. Charters, Louise Stanley, visitors.

MONTANA: F. B. Linfield, F. S. Cooley, A. W. Richter, Alfred Atkinson, delegates.

NEBRASKA: Samuel Avery, E. A. Burnett, C. W. Pugsley, O. V. P. Stout, delegates; A. E. Anderson, Alice M. Loomis, visitors.

NEVADA: C. A. Norcross, J. G. Scrugham, delegates.

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New Hampshire: J. C. Kendall, F. W. Taylor, C. E. Hewitt, Helen Knowlton, delegates.

New Jersey: W. H. S. Demarest, J. G. Lipman, Alva Agee, A. A. Titsworth, delegates; Frank App, visitor.

New Mexico: G. E. Ladd, Fabian Garcia, A. C. Cooley, delegates; Mrs. Fabian Garcia, visitor.

New York: W. H. Jordan, A. R. Mann, T. L. Lyon, A. W. Smith, M. C. Burritt, D. J. Crosby, R. H. Wheeler, delegates; C. G. Atwater, H. C. Brewer, C. W. Burkett, E. O. Fippin, E. G. Montgomery, J. W. Pincus, P. V. Stephens, visitors.

North Carolina: W. C. Riddick, B. W. Kilgore, delegates; C. R. Hudson, C. B. Williams, visitors.

North Dakota: E. F. Ladd, T. P. Cooper, E. S. Keene, delegates.

Ohio: W. O. Thompson, C. E. Thorne, Alfred Vivian, C. S. Wheeler, E. F. Coddington, delegates; F. E. Bear, E. Orton, Jr., O. M. Johnson, Herbert Osborn, Edna N. White, visitors.

Oklahoma: J. W. Cantwell, W. L. Carlyle, J. A. Wilson, Alfred Boyd, C. E. Sanborn, delegates.

Oregon: W. J. Kerr, A. B. Cordley, R. D. Hetzel, Anna M. Turley, delegates.

Pennsylvania: R. L. Watts, M. S. McDowell, R. L. Sackett, Sara C. Lovejoy, delegates; H. P. Armsby, Edith Baer, E. W. Bacon, William Frear, F. D. Gardner, John Hamilton, J. P. Jackson, visitors.

Rhode Island: Howard Edwards, B. L. Hartwell, R. L. Wales, E. K. Thomas delegates; R. S. Burlingame, Z. W. Bliss, W. E. Ranger, visitors.

South Carolina: W. M. Riggs, J. N. Harper, S. B. Earl, delegates.

South Dakota: E. C. Perisho, N. E. Hansen, G. W. Randlett, delegates; Inez B. Perisho, visitor.

Tennessee: Brown Ayres, H. A. Morgan, C. A. Keffer, C. E. Ferris, delegates; C. E. Allred, Virginia P. Moore, W. J. Hale, Louise G. Turner, visitors.

Texas: W. B. Bizzell, B. Youngblood, D. W. Spence, delegates; J. E. Boog-Scott, A. B. Conner, G. S. Fraps, M. L. Hayes, J. O. Morgan, Charles Puryear, James Sumner, T. O. Walton, visitors.

Utah: E. G. Peterson, F. S. Harris, J. T. Caine, III, C. W. Porter, delegates.

Vermont: G. P. Benton, J. L. Hills, Thomas Bradlee, J. W. Votey, delegates; Jay Coryell, visitor.

Virginia: A. W. Drinkard, Jr., J. M. Jones, L. S. Randolph, C. K. Graham, delegates; Mrs. C. K. Graham, R. T. Neal, Edith A. Roberts, P. F. Skofield, visitors.

Washington: E. O. Holland, I. D. Cardiff, delegates; R. B. Coglon, visitor.

West Virginia: F. B. Trotter, J. L. Coulter, C. R. Titlow, C. R. Jones, Rachel H, Colwell, delegates; N. T. Frame, C. H. Hartley, Byrd Prillerman, visitors.

Wisconsin: H. L. Russell, K. L. Hatch, F. E. Turneaure, L. R. Jones, delegates; Abby L. Marlatt, D. H. Otis, visitors.

Wyoming: C. A. Duniway, H. G. Knight, A. E. Bowman, delegates.

Porto Rico: B. F. Andrews, delegate; W. V. Tower, visitor.

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UNITED STATES DEPARTMENT OF AGRICULTURE: A. C. True, E. W. Allen, Bradford Knapp, C. B. Smith, delegates; W. H. Beal, O. H. Benson, L. A. Clinton, H. M. Connolly, W. H. Evans, Samuel Fortier, Mrs. Samuel Fortier, E. J. Glasson, A. B. Graham, F. E. Heald, H. B. Hendrick, H. L. Knight, C. H. Lane, H. L. Lang, C. F. Langworthy, C. E. Leighty, J. D. Luckett, E. Merritt, E. A. Miller, M. D. Moore, E. H. Nollau, M. B. Oates, L. W. Page, G. H. Stephenson, H. W. Truesdell, H. J. Wilder, D. W. Working, visitors.

UNITED STATES DEPARTMENT OF THE INTERIOR: BUREAU OF EDUCATION: P. R. Claxton, S. P. Capen, A. C. Monahan, C. D. Jarvis, delegates.

DISTRICT OF COLUMBIA: P. V. Collins, F. E. Geldenhuys, R. W. Redman, G. H. Shaw, visitors.

CANADA: W. J. Black, J. C. McLean, G. A. Putnam, visitors.

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Constitution

NAME

This Association shall be called the Association of American Agricultural Colleges and Experiment Stations.

OBJECT

The object of this Association shall be the consideration and discussion of all questions pertaining to the successful progress and administration of the colleges and stations included in the Association, and to secure to that end mutual cooperation.

MEMBERSHIP

(1) Every college established under the act of Congress approved July 2, 1862, or receiving the benefits of the act of Congress approved August 30, 1890, and every agricultural experiment station established under state or congressional authority, the Bureau of Education of the Department of the Interior, the Department of Agriculture, and the Office of Experiment Stations of the last named Department shall be eligible to membership in this Association.

(2) Any institution a member of the Association in full standing may send any number of delegates to the meetings of the Association. The same delegate may represent both a college and a station, but shall vote in only one section, and shall cast only one vote in general sessions. Other delegates may be designated by an institution to represent it in specified divisions of the sections of the Association, but such delegates shall vote only in such divisions and no institution shall be allowed more than one vote in any sectional meeting.

(3) Delegates from other institutions engaged in educational or experimental work in the interest of agriculture or mechanic arts may, by a majority vote, be admitted to conventions of the Association with all privileges except the right to vote.

(4) In like manner, any person engaged or directly interested in agriculture or mechanic arts who shall attend any convention of this Association may be admitted to similar privileges.

SECTIONS

(1) The Association shall be divided into three sections: (*a*) a section on college work and administration, (*b*) a section on experiment station work, (*c*) a section on extension work, composed of directors or superintendents of extension departments in the institutions in this Association, or the representatives of such departments duly and specifically accredited to this section.

The section on college work and administration shall be composed of the presidents or acting presidents of colleges and universities represented in the Association, or other representatives of such institutions duly and specifically accredited to this section, and no action on public and administrative questions shall be final without the assent of this section.

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The section on experiment station work shall be composed of the directors or acting directors of experiment stations represented in the Association, or of other representatives of such stations duly and specifically accredited to this section.

(2) Members of these three sections (and no others) shall be entitled to vote both in general sessions and in the section to which they respectively belong.

The representative appointed by the United States Bureau of Education shall be assigned to the section on college work and administration; the representative of the Office of Experiment Stations to the section on experiment station work; and the representative of the United States Department of Agriculture to either section as he may elect and the section by vote authorize; but such election once made and authorized may not be changed during the sessions of a given convention.

Each section may create such divisions as it may from time to time find desirable, and shall elect its own chairman and secretary for sectional meetings, whose names shall be reported to the Association for record.

(3) Each section shall conduct its own proceedings, and shall keep a record of the same, and no action of a section, by resolution or otherwise, shall be valid until the same shall have been ratified by the Association in general session, and, in the case provided for in the foregoing paragraph, (1) shall also have been approved by the section on college work and administration.

MEETINGS

(1) This Association shall hold at least one meeting in every calendar year, to be designated as the annual convention of the Association. Special meetings may be held at other times, upon the call of the Executive Committee, for purposes to be specified in the call.

(2) The annual convention of the Association shall comprise general sessions and meetings of the sections, and provision shall be made therefor in the program. Unless otherwise determined by vote, the Association will meet in general session in the forenoons and evenings of the convention and the sections in the afternoons.

OFFICERS

(1) The general officers of this Association, to be chosen annually, shall be a president, five vice-presidents, a bibliographer, and a secretary, who shall also be treasurer, and an Executive Committee of five members, three of whom shall be chosen by the section on college work and administration and two by the section on experiment station work; *provided*, however, that a member chosen by either section need not be a member of that section. The Executive Committee shall choose its own chairman.

(2) Each section shall, by ballot, nominate to the Association in general session for its action a chairman and a secretary for such section.

(3) The president, vice-president, secretary and bibliographer of this Association shall be elected by ballot upon nomination made upon the floor of the convention, and shall hold office from the close of the convention at which they are elected until their successors shall be chosen.

(4) Any person being an accredited delegate to an annual meeting of the Association, or an officer of an institution which is a member of the Association in full standing at the time of election, shall be eligible to office.

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DUTIES OF OFFICERS

(1) The officers of the Association shall perform the duties which usually devolve upon their respective offices.

(2) The president shall deliver an address at the annual convention before the Association in general session.

(3) The Executive Committee shall determine the time and place of the annual conventions and other meetings of the Association, and shall between such conventions and meetings act for the Association in all matters of business. It shall issue its call for the annual conventions of the Association not less than sixty days before the date on which they are to be held, and for special meetings not less than ten days before such date. It shall be charged with the general arrangements and conduct of all meetings called by it. It shall designate the time and place of the convention. It shall present a well-prepared order of business, of subjects for discussion, and shall provide and arrange for the meetings of the several sections. The subjects provided for consideration by each section at any convention of the Association shall concentrate the deliberations of the sections upon not more than two lines of discussion, which lines as far as possible, shall be related. Not more than one-third of the working time of any annual convention of the Association shall be confined to miscellaneous business.

FINANCES

At every annual convention the Association in general session shall provide for obtaining the funds necessary for its legitimate expenses and may, by appropriate action, call for contributions upon the several institutions eligible to membership; and no institution shall be entitled to representation or participation in the benefits of the Association unless such institution shall have made the designated contribution for the year previous to that in and for which such question of privilege shall rise, or shall have said payment remitted by the unanimous vote of the Executive Committee.

AMENDMENTS

This constitution may be amended at any regular convention of the Association by a two-thirds vote of the delegates present, if the number constitute a quorum; *provided*, that notice of any proposed amendment, together with the full text thereof and the name of the mover, shall have been given at the next preceding annual convention and repeated in the call for the convention. Every such proposition of amendment shall be subject to modification or amendment in the same manner as other propositions, and the final vote on the adoption or rejection shall be taken by yeas and nays of the institutions then and there represented.

RULES OF ORDER

(1) The Executive Committee shall be charged with the order of business subject to special action of the convention, and this committee may report at any time.

(2) All business or topics proposed for discussion and all resolutions submitted for consideration of the convention shall be read and then referred, without debate, to the Executive Committee to be assigned positions on the program.

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(3) Speakers invited to open discussion shall be entitled to twenty minutes each.

(4) In general discussions the ten-minute rule shall be enforced.

(5) No speaker shall be recognized a second time on any one subject while any delegate who has not spoken desires to do so.

(6) The hours of meeting and adjournment adopted with the general program shall be closely observed, unless changed by a two-thirds vote of the delegates present.

(7) The presiding officer shall enforce the parliamentary rules usual in such assemblies and not inconsistent with the foregoing.

(8) Vacancies which may arise in the membership of standing committees by death, resignation, or separation from the Association of members shall be filled by the committees respectively.

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Proceedings of the Thirtieth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations

MINUTES OF THE GENERAL SESSIONS

Morning Session, Wednesday, November 15, 1916

The Convention was called to order at 9 A. M. at the New Willard Hotel, Washington, D. C., by the president, C. E. Thorne of Ohio.

Prayer was offered by President W. O. Thompson of Ohio.

The President. The secretary has a brief announcement to make.

The Secretary. At our last meeting in Berkeley, California, President Bryan used a tack hammer as a gavel. Believing that a tack hammer is not a fitting instrument for this purpose, I then resolved to substitute something more appropriate.

About a year ago Dean Votey of the College of Engineering of the University of Vermont, while in the town of Strafford, Vermont, secured a section of a limb of a sugar maple planted in his early manhood on his lawn by Justin S. Morrill. This limb, which had been recently wrested off by a storm, reached over towards the library where Senator Morrill used to sit. Perhaps it is not too much to say that under its shadow he may have brooded over the legislation which gave rise to the institutions we represent.

This gavel was shaped from this section of maple wood in the shops of our College of Engineering. Acting in behalf of the University of Vermont, I am proud to present it to this Association, and to express the hope that in the hands of succeeding presidents it may be used for many generations in its governance.

The President. Your president looks upon it as a special piece of good fortune that he is permitted to be the first president of this Association to use this gavel.

The report of the Executive Committee will be made by its chairman, President W. O. Thompson of Ohio.

Report of the Executive Committee

The Executive Committee begs leave to submit the following report of its activities for the year just closing.

1. Aside from the usual meetings held in connection with the Convention, the committee held an important meeting at Amherst, Mass., July 11 to 13. At that time a joint conference was held with the States Relations Service of the United States Department of Agriculture and with the Association's committee on extension organization and policy. The chief topics before the conference pertained to the cooperative work between the Federal Government and the several States in carrying forward the work under the Smith-Lever Act. The conference was marked by perfect candor and the utmost cordiality. No restraint in the statement of facts and conditions existed and, as a result, a satisfactory understanding was reached. Both parties expressed a willingness to abide by the memorandum

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of agreement presented to this Association in 1914. In the early experiences with this new enterprise it was to be expected that some unhappy and unfortunate experiences would develop. In this we have not been entirely disappointed. The happy and encouraging feature is, however, that all parties to the experience have shown the commendable quality of frankness in dealing with these situations involving misunderstandings and some mistakes.

As a general statement the Executive Committee may direct attention to the following items as indicating the scope of the conference:

a. The proper organ of communication between the Federal Government and the States. It was agreed that the state extension director should be the proper means of communication.

b. The appointment and service of specialists in subject matter for the States.

c. The provision for and calling of conferences.

d. The provision of a contingent fund for work of an emergency character and for other incidental work.

e. The method to be followed in the matter of reports.

f. The general principles to be recognized in dealing with the matter of projects.

g. The problem of differentiating between the educational and the regulatory work as carried on by the United States Department of Agriculture.

All these and some minor matters were discussed thoroughly and satisfactory conclusions reached. These conclusions were put into writing and served as a basis of further work.

Since that time some experiences have shown that the agreement was not given full sway through some causes not understood. Since the assembling of the several meetings surrounding this Convention, a number of conferences have been held, and it is believed that distinct and definite progress has been made in adjusting the difficulties and in providing against similar experiences in the future.

The committee on extension organization and policy will report on these matters more in detail (pages 134 to 139), and for that reason further mention need not be made in this report.

2. The Executive Committee has had under consideration the operation of the National Defense Act, and particularly the portion pertaining to the Reserve Officers' Training Corps. A discussion of this feature of the federal enactment is listed on the program, which it is believed will tend to relieve the uncertainty now existing in the minds of several college executives.

3. An important conference with representatives of the National Association of State Universities, of certain military academies, and of the War College, was held in November, 1915, for the discussion of the principles to be embodied in the then proposed legislation dealing with the Reserve Officers' Training Corps. This subject will be reviewed in a paper to be presented on Friday morning's program.

Respectfully submitted,

W. O. THOMPSON, *Chairman*

On motion, the report of the Executive Committee was received.

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The report of the treasurer was submitted by J. L. Hills of Vermont, as follows:

Report of the Treasurer

August 11, 1915 to November 15, 1916

RECEIPTS

To balance on hand, Berkeley meeting	$ 416 96
To 50 dues from colleges at $35	1,750 00
To 50 dues from stations at $20	1,000 00
To six dues from colleges (previous years)	225 00
To one dues from station (previous year)	20 00
To certificate of deposit of January 24, 1916, with six months' interest	2,040 00
Total receipts	$5,451 96
Disbursements as per statement	5,328 03
Balance on hand November 15, 1916	$ 123 93

DISBURSEMENTS

Executive Committee	$ 838 16
Committee on graduate school	45 62
Committee on extension work	124 77
Secretary-treasurer	54 33
Proceedings Twenty-ninth Convention (printing, proofreading, stenographic service, expressage, postage, programs, badges, placards, attendance, etc.)	1,265 15
Graduate school subscription	2,000 00
Certificate of deposit (February 18, 1916)	1,000 00
Total disbursements	$5,328 03

ASSETS

Cash on hand, November 15, 1916	$ 123 93
Certificate of deposit (City Trust Co., January 24, 1916)	3,000 00
Certificate of deposit (City Trust Co., February 18, 1916)	1,000 00
Ten months' interest at four percent on $3,000 (Nov. 24)	100 00
Nine months' interest at four percent on $1,000 (Nov. 18)	30 00
	$4,253 93

On motion, the report of the treasurer was referred to an auditing committee consisting of E. A. Burnett of Nebraska and W. E. Stone of Indiana, which, later, reported as follows:

Report of Auditing Committee

The auditing committee has examined the accounts of the treasurer and found same to be correct. It finds all vouchers properly receipted and

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on file. It also finds a bank balance as stated of $123.93, and finds in the treasurer's hands two (2) certificates of deposit totaling $4,000, bearing dates of January 24 and February 18, 1916, bearing simple interest at the rate of four percent per annum.

E. A. BURNETT,
W. E. STONE,
Auditing Committee.

On motion, the report of the auditing committee was received and adopted.

THE PRESIDENT. I have now great pleasure in introducing to you the Honorable Secretary of Agriculture.

ADDRESS OF D. F. HOUSTON, SECRETARY OF AGRICULTURE

I am very glad to meet the members of this body again. It is always a pleasure to me to meet those who are interested in similar things and have somewhat similar responsibilities; and it is a peculiar pleasure to me to meet those with whom the Department is cooperating not only under the compulsion of law, but very far beyond the requirements of law, and with whom I hope it will increasingly cooperate. Personally, I very much prefer to work with people than to work in isolation or independently; I very much prefer to work with people rather than to work at cross purposes with them or to work against them; and one of the most satisfactory things to me during my stay here in Washington has been the opportunity to work in close cooperation and harmony with the representatives of the great Land-Grant Colleges of the Union.

When I first had the pleasure of meeting you, our minds were very much occupied with the problem of coordinating the agricultural activities of the Nation. The difficulties presented themselves especially in the field of extension work. The extension activities were greatly stimulated by the Agricultural Extension Act; but I think I may say without exaggeration that through the operations of that Act the good relations between the Federal Department and the Land-Grant Colleges have been greatly promoted. There are still rough places to be smoothed out, but I personally know of no differences which may not be satisfactorily dealt with if we continue to manifest breadth of view and a singleness of mind for public service; and I wish to pledge this body again the continued, generous aid and cooperation of the Department of Agriculture, not only in this field but also in all other fields where joint action will secure better service for the people of the Nation.

What is in my mind in addition to this has to do with the newer undertakings of the Nation and of the Department. Three years ago we were beginning to perceive that we were entering in a systematic and larger way into what I think may be called the second half of agriculture, that part of agriculture embracing distribution, marketing, rural finance and rural organization. Then there were certain things in contemplation. A fairly well-defined program had been marked out. Now I am happy to report progress, substantial and significant, the completion in large measure of the program which was marked out three years ago.

You know that before that time there was, neither in the States nor in the Federal Government, any effective agency to conduct investigations

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in the field of rural economics or to furnish assistance and guidance to the farmer in these very urgent and difficult problems. Today we have in the Federal Department of Agriculture the largest, best-organized Office of Markets, I think, to be found anywhere in the world, whose activities have already so commended themselves to the people of the United States and to their representatives as to lead Congress to give it for the current year an appropriation of something over a million dollars. Its staff is busily engaged in investigating many of the great problems of marketing confronting the producers, the business world and the consumers, and in recognition of the position which its work now gives it, and of the responsibility imposed upon it for the administration of a number of important laws, I have recommended in the estimates for the ensuing year that this Office be made a Bureau of the Department.

It is interesting to me to note that the States have increasingly perceived the importance of these problems of distribution and are very rapidly developing agencies and instrumentalities to deal with them. I think 15 States have already provided central marketing bureaus or agencies and there is legislation pending in other states.

Even more interesting, in some respects, has been the rapid expansion of the activities of the Land-Grant Colleges and Universities, and of other universities, in furnishing facilities for investigations in this field and in enriching their curricula to afford students an opportunity to become acquainted with such problems. A few years ago there was a mere handful of economists who were considering the problems of rural economics and only a few colleges which were offering many courses in this subject. At present every considerable institution has such courses, and I think at least 25 of them now give from three to 15 or 16 courses.

And yet, we are just at the beginning of things. We have had enacted, within a comparatively short time, a number of exceedingly important and significant laws dealing with problems of distribution: the cotton futures act, the grain standards act, the permissive warehouse act, the farm loan act, the provisions of the federal reserve act conceived with special regard for the peculiar needs of the farmers, and the federal aid road act. I shall not tax your patience with a discussion of these measures. I assume that the members of this body are familiar with them. I am convinced that they will tend to remedy a number of abuses, to modify general conditions affecting agriculture and rural life and in very helpful ways to conduce to a more orderly, systematic and economic distribution of farm products, and improve country life. I believe they will tend to foster a better organization of rural life, and will be of consequence and value not only to the producer, but to the business world and to the consumer as well. They open up new, fresh and exceedingly interesting problems for study by instructors and students; and one especially interesting thing is that they are opening up a new field of interest and thought to the business man and directing his attention emphatically to aspects of his own business which he has heretofore overlooked. A very striking indication of this fact has been afforded us within the quite recent past. We have been for some time exceedingly busy with the difficult task of finding men to administer these new laws, men to administer the cotton futures act, the grain standards act, and the others I have cited. Now, from the staff which we had secured to administer one of these laws alone, which we had secured only within the last two years, we have had taken from us in the last four months seven

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men, to whom we paid salaries ranging from $1,500 to $3,000, to occupy positions at salaries ranging from $8,000 to $12,500. Business men have discovered that these men knew more about certain aspects of their own business than they did. I think this is going to continue, and it must be a matter of interest to the young men in your institutions, and to your faculties, to know that there is here again offered a large opportunity for leadership. I desire again in this way to emphasize the increasing calls and demands made upon you and your institutions to furnish leadership.

It seems to me it is worth while noting, in this day of national self-criticism and self-depreciation, that the American people have succeeded in building up in agriculture instrumentalities which in scope and efficiency exceed the combined agencies of any two or three other nations in the world. To the Land-Grant Colleges, with their income of $32,000,000, with their faculties of 4,700 individuals and their student bodies of 65,000, there is no parallel to be found, and I think I am safe in saying that in the Department of Agriculture the Nation has the largest single scientific and practical agency in the world. The American farmer is, perhaps, the most successful farmer to be found. He does not produce more per acre than other farmers, but I am told that he does produce from one and a half to two or three times as much per man or per unit of labor and capital as the farmer of Europe. The American laborer generally is conceded by the best authorities I know to be the most alert laborer in the world; and this statement applies to the American farmer. He is still pioneering a continent. Now he has in increasing degree the aid of these great agencies, the Land-Grant Colleges and the Federal Department of Agriculture. I am therefore optimistic as to the future. If we do our part wisely, if we cooperate with him effectively, he will not only feed this Nation, which adds to its population a nation every 15 years, but will increasingly feed the world.

THE PRESIDENT. I am sure that I express the unanimous sentiment of the Association in thanking the Honorable Secretary for his interesting address.

On motion, to members of the National Association of State Universities and to other persons appropriately representing interests involved in the Newlands bill, were extended the courtesies of the floor.

THE PRESIDENT. The discussion of the Newlands bill will be opened by Dean A. Marston of Iowa.

PROPOSED LEGISLATION TO ESTABLISH ENGINEERING EXPERIMENT STATIONS

BY A. MARSTON

The original Land-Grant Act of 1862 provided, in Section 5, for systematic research at each land-grant institution, and for the publication of the results. The language used is as follows:

"FOURTH.—An annual report shall be made regarding the progress of each college, recording any improvements and experiments made, with their cost and results and such other matters, including state, industrial and economic statistics, as may be supposed useful;—".

The research side of their work was much neglected in the Land-Grant Colleges prior to the passage of the Hatch Act, in 1887, establishing agricultural experiment stations. Agricultural research then became a very im-

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portant part of land-grant college work, and the single annual report originally required soon developed into numerous bulletins, widely distributed. The work of these stations has been of incalculable benefit to our agricultural industries.

Logically, Congress should have provided at the time of the passage of the Hatch Act for engineering experiment stations as well as agricultural stations and doubtless this action might have been taken at that time if engineering science had been as backward as agriculture. It was the crying needs of agriculture, rather than any intentional neglect of mechanic arts, which led to the omission of provision for engineering research. But the credit for developing systematic engineering research under government auspices has been lost to the United States and, in consequence of the mistake, all our mechanical and chemical industries have suffered severely. Germany and other foreign countries have taken the lead in scientific industrial investigation.

The need for engineering experiment stations has become increasingly apparent, especially at the land-grant institutions, which have by federal law a most intimate relation to our industries and to the industrial classes, and which have had the privilege of directing and observing the wonderful work of the agricultural experiment stations. The Association of American Agricultural Colleges and Experiment Stations repeatedly has endorsed the proposal that Congress shall establish government-aided engineering experiment stations at land-grant institutions.[1] Several such institutions have formally organized engineering experiment stations, without waiting for national assistance. The University of Illinois and the Iowa State College were the first to take such action, in the winter of 1903-1904, and they expend respectively $40,000 and $25,000 annually in the work. In Iowa and in Ohio, at least, these stations were established by the state legislatures. Wisconsin, Kansas, Illinois, Missouri, the State Colleges of Pennsylvania and Texas and others have organized engineering experiment stations on the sole authority of their boards of regents. Work of an experiment station order is carried on at several other land-grant institutions in some special lines, as notably in mining at Nevada, Oregon, West Virginia and elsewhere.

At least two non-land-grant institutions have also established engineering experiment station organizations, in one case by legislative enactment.

The first attempt to secure the establishment of a federal-aided engineering experiment station in each state was made about 1905-6, by Representative McKinley, of Illinois, largely on the initiative of Professor L. P. Breckinridge, then of the University of Illinois. It failed, partly because of lack of active effort by the institutions affected and partly because of certain jealousies and conflicts of interest.

The organization of the Land-Grant College Engineering Association, in 1913, did much to reawaken interest in the subject. The importance and value of engineering experiment stations have been favorite topics for discussion at every meeting. The Association of American Agricultural Colleges and Experiment Stations has formally renewed its approval of the plan by resolutions adopted at the annual convention last year.

Senator Newlands, of Nevada, introduced an engineering experiment station bill last March (Senate File No. 4874), the text of which is attached

[1] Twenty-ninth Proceedings; pp. 27, 82 and 152.

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to this paper as an appendix. The bill provides for an engineering experiment station at the land-grant institution in each State or Territory, with an annual federal appropriation of $15,000 per station, to be expended under the direction of the Secretary of the Interior.

The bill was referred to the Committee on Agriculture and Forestry. It has been actively supported by the executive committee of the Land-Grant College Engineering Association, which arranged a hearing before the committee on June 24, 1916, at which the following representatives of land-grant institutions appeared: Dean A. A. Potter of Kansas, Professor F. H. Newell of Illinois, Dean E. T. Coddington of Ohio, Professor G. R. Chatburn of Nebraska, Professor F. F. Thompson of New Jersey, and Dean D. W. Spence of Texas. The active support of the Naval Consulting Board was also secured.

Some opposition to the Newlands bill has arisen from a few of the State Universities which are not land-grant institutions, because the appropriations for their States would not be for their benefit; but the principal difficulty in securing the early passage of the bill by the Senate has arisen from the fact that the Association of American Agricultural Colleges and Experiment Stations as a body and the land-grant institutions as individual members have not been aroused as yet actively to support the measure with all their powers.

In the judgment of the writer, it will be essential that the Executive Committee of the Association of American Agricultural Colleges and Experiment Stations assume the principal direction of the movement, if it is to succeed. One of the members of the Senate Committee before which the hearing of June 24 was held spoke of the "great and irresistible pressure" exerted by this Association to secure meritorious needed legislation; but this great power cannot be exerted by the executive committee of the Land-Grant College Engineering Association, which, by action taken at Berkeley last year, is now merely a division of a section of the general association. I am sure that that committee is not only willing but anxious to place itself under the direction of the Executive Committee of the general association if it will assume active direction of the movement.

A committee appointed by the National Research Council has reported that in four-fifths of the States and Territories, the proposed engineering experiment stations should be located, without question, at the land-grant institutions. Hence, there can be no doubt that the congressional representatives of these States in Congress have the power to pass the bill, and there is little doubt that they will do so if shown by the authorities of their respective institutions and by our general Executive Committee that the measure is meritorious and needed.

There are many reasons, only four of which need be mentioned, why Congress should prescribe that the proposed engineering experiment stations shall be located at the land-grant institutions.

First.—The proposed work is industrial research, not general scientific investigation. Hence, it can be carried on best by the land-grant institutions, for they are by law and in fact associated intimately with the industries and the industrial classes. The ideals and the work of the separate State Universities are professional rather than industrial.

Second.—There are many subjects of engineering research which are vitally related to agriculture. Highways, irrigation, drainage, the man-

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ufacture of farm products, transportation, machinery, power, the distribution of electricity, telephones, sanitation and building are examples. Research in all these lines should be associated most intimately with agricultural research.

Third.—The land-grant institutions already possess extensive laboratories, together with administrative organizations trained in directing industrial research. Hence, they are well fitted to conduct the proposed work.

Fourth.—The land-grant institutions are already partly supported by federal appropriations. To grant federal aid to other state institutions, or to those privately endowed, would establish a new precedent which would lead in all probability to enormous demands upon the national treasury in the near future.

It has been suggested that the passage of a simple amendment to the Hatch Act might be made to accomplish substantially the same result sought by the Newlands bill.

It is argued that there are a few states in which the land-grant institutions possess such inferior laboratory facilities as compared with other state and private institutions as to make a different location of the engineering experiment station preferable. This objection, if it be meritorious, can easily be met by a slight modification of the Newlands bill, without sacrificing the requirement that the stations shall be located at the land-grant institutions.

One of the principal difficulties encountered in connection with the Newlands bill has been the selection of the proper department of the Federal Government to supervise and coordinate the work. The Secretary of the Interior has been mentioned, because he has charge of the Bureau of Education; the Secretary of Agriculture, because he has charge of the related industrial research in agriculture; and the Secretary of Commerce, because he is more closely associated with the mechanic arts industries and is in charge of the Bureau of Standards, which has become a great government experimental station. The author of the Newlands bill and its supporters have never expressed decided preference as between these three departments, although the Secretary of the Interior was prescribed in the original text.

Since the introduction of the Newlands bill, President Wilson has organized a "National Research Council," consisting of 36 men appointed by the President of the National Academy of Science. The National Research Council appointed the following committee to report upon the Newlands bill: R. A. Millikan, chairman, Professor of Physics, Chicago University; M. I. Pupin, Professor of Electric-Mechanics in the Physics Department of Columbia University; and W. R. Whitney, of the General Electric Company, at Schenectady, a member of the Naval Consulting Board. This committee called in consultation, Mr. Phinehas V. Stephens, an engineer of New York, who is a graduate and representative of the Georgia Institute of Technology, and Mr. S. W. Stratton, Director of the United States Bureau of Standards. This committee reported under date of September 12, recommending important changes in the bill. The report was considered by the National Research Council at a meeting held September 29, but the subject was left open for further investigation and conference.

Evidently a conference should be held at once between the National

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Research Council and the Executive Committee of the Association of American Agricultural Colleges and Experiment Stations, together with representatives of the Land-Grant College Engineering Association. It is hoped that such a conference can be held this week.

The committee appointed by the National Research Council recommended the adoption in the bill of the principle of national coordination and supervision. This principle will doubtless be acceptable to the States, provided that it is not developed so far or in such a manner as to interfere objectionably with the separate state control which is essential to insure that the main purpose of the stations shall be to carry on industrial research which shall develop and aid state industries.

The main purposes of a state engineering experiment station are perhaps fairly well expressed in the following statement which is carried on the inside of the front cover of every Iowa bulletin:

"The purpose of the engineering experiment station is to afford a service, through special investigations, evolution of new devices and methods, tests and analyses of materials and expert advice:

First—for the manufacturing and other engineering industries of Iowa;

Second—for the urban population of the State in solving the engineering problems of urban life;

Third—for the agricultural population and industries of the State in the solution of their engineering problems."

Experience with agricultural experiment stations indicates that inevitably a large part of the funds for the support of state engineering experiment stations will come eventually from state appropriations. Iowa and Illinois already appropriate much larger sums than the $15,000 proposed in the Newlands bill.

A large degree of state control is proper and essential. The Land-Grant Colleges are official state institutions, which already exercise such control of agricultural research, and are eminently qualified to serve the same function for mechanic arts. Nevertheless, contributions to general engineering science will also form an important part of the work of the engineering experiment stations, and this kind of work should be coordinated and supervised by the Federal Government in such a manner as to insure efficiency and the avoidance of undesirable duplication. Likewise, the development of the industries of the several States ought to proceed in a manner consistent with national efficiency and preparedness.

While we can thus endorse the principle of a reasonable amount of national supervision and coordination, we must, on the other hand, condemn the recommendation of the committee of the National Research Council for the creation of a new Industrial Research Board in each State, merely to direct the engineering experiment stations. The committee proposal that the members of each such board should be the Secretary of Commerce of the United States, two members appointed by the National Academy of Science and the Governor of the State, is especially objectionable. Such boards would be costly, inefficient, and unnecessary. There are plenty of existing organizations which can do the same work better and at less cost. The proposed membership is such as to leave the State little to say about the use of its own laboratories, the expenditure of its own funds and the development of its own industries through industrial research.. One

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national authority can perform every proper function more efficiently in every way than 50 separate boards.

The committee which reported to the National Research Council in favor of the 50 research boards seemed to think that we might thereby dodge the opposition of the separate State Universities. This is a mistaken belief. We should endeavor to conciliate the separate State Universities if possible, but not at the expense of a vital principle, such as the coordination of mechanic arts and agricultural research. Moreover, we should be assuming a burden heavier than the one from which relief is sought should we accept the obligation to commit the Federal Government to the policy of subsidizing separate State Universities. Such issues must be faced, not dodged.

The conclusions reached in this paper may be summarized in closing, as follows:

1. The Newlands engineering experiment station bill (Senate File No. 4874) deserves passage in the interests of industrial development in all the States and Territories and of national efficiency and preparedness.

2. The Newlands bill, or an amendment to the Hatch Act to the same general effect, should receive active support from the Association of American Agricultural Colleges and Experiment Stations. Its Executive Committee should assume direction, with special cooperation from the engineering division. Each land-grant institution should at once take up the subject with the leaders of industry in its State and with its senators and representatives, all under the direction of the Executive Committee.

3. The Executive Committee of the Association of American Agricultural Colleges and Experiment Stations should arrange a conference on the measure at once with the National Research Council.

4. The Newlands bill should not be modified to establish new state boards to take charge of industrial research.

5. The requirement that the proposed engineering experiment stations shall be located at the Land-Grant Colleges should be maintained at all costs as a vital principle, in order to secure the coordination of mechanic arts and agricultural research, and to help establish more firmly and broadly the great system of industrial education and research to which the United States committed itself 54 years ago in the passage of the Morrill Act.

The recent, wonderful, scientific, industrial development of Europe, and the national organization for efficiency which has been forced upon every European nation by the events of the great war, have demonstrated our own woeful lack of industrial and national efficiency. Our need is now as crying in mechanic arts as it was in agriculture in 1887. The establishment of federal-aided engineering experiment stations at the land-grant institutions under national supervision is vital to our national efficiency and preparedness.

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APPENDIX

TEXT OF THE NEWLANDS ENGINEERING EXPERIMENT STATION BILL

64th Congress, 1st Session } S. 4874

IN THE SENATE OF THE UNITED STATES

March 9th, 1916

Mr. Newlands introduced the following bill; which was read twice and referred to the Committee on Agriculture and Forestry.

A BILL

To establish experiment stations in engineering and in the other branches of the mechanic arts in connection with the colleges established in the several States and Territories under the provisions of an Act approved July 2nd, eighteen hundred and sixty-two, and of the Acts supplementary thereto.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with engineering and the other branches of the mechanic arts, and to promote the scientific investigation and experiment respecting the principles and applications of the mechanic arts, there shall be established under the direction of the land-grant college in each State and Territory established, or which may hereafter be established, in accordance with the provisions of an Act approved July 2nd, eighteen hundred and sixty-two, entitled "An Act donating public lands to the several states and territories which may provide colleges for the benefit of agriculture and the mechanic arts," or any of the Acts supplementary to said Act, a department to be known and designated as an "engineering" or a "mechanic arts experiment station."

SEC. 2. That it shall be the object and duty of said experiment stations to conduct original researches, to verify experiments, and to compile data in engineering and in the other branches of the mechanic arts as applied to the interests of the people of the United States, and particularly of such as are engaged in the industries; also to conduct researches, investigations and experiments in connection with the production, transportation, extraction, and manufacture of substances utilized in the application of engineering and of other branches of the mechanic arts to industrial pursuits; water supplies as to potability and economic distribution; sewage purification and its ultimate inoffensive disposal; economic disposal of urban and manufacturing wastes; flood protection; architecture; road building; engineering problems connected with transportation, manufacturing, and public utilities; and such other researches or experiments bearing directly on the various industries and occupations of the people of the United States as may in each case be deemed advisable, having due regard to the varying conditions, resources, and needs of the people of the respective States and Territories.

SEC. 3. That bulletins giving results of investigations or reports of progress shall be published at said stations at least once in six months, copies of which shall be sent to persons, newspapers, institutions, and

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libraries interested in engineering and in other branches of the mechanic arts as may request same in the States and Territories in which the stations are respectively located, and to others as far as the means of the station will permit.

Such bulletins or reports, and the annual reports of said stations, shall be transmitted in the mails of the United States free of charge for postage under such regulations as the Postmaster General may from time to time prescribe.

SEC. 4. That for the purpose of paying the necessary expenses of conducting investigations and experiments, printing, and distributing the results as hereinbefore described the sum of $15,000 per annum is hereby appropriated to each State and Territory, to be especially provided for by Congress in the appropriation from year to year, out of money in the treasury not otherwise appropriated, to be paid in equal quarterly payments on the first day of January, April, July and October in each year to the treasurer or other officer duly appointed by the governing boards of said colleges to receive the same, the first payment to be made on the first day of October, nineteen hundred and sixteen.

SEC. 5. That whenever it shall appear to the Secretary of the Treasury from the annual statements of receipts and expenditures of any of said stations that a portion of the preceding annual appropriation remains unexpended, such amount shall be deducted from the next succeeding annual appropriation to such station in order that the amount of money appropriated to any station shall not exceed the amount actually and necessarily required for its maintenance and support.

SEC. 6. That in order to secure as far as practicable uniformity of methods and economical expenditure of funds in work of said stations the supervision of the proposed experiment stations shall rest with the Secretary of the Interior.

It shall be the duty of said stations annually, on or before the first day of February, to make to the governor of the State or Territory in which it is located a full and detailed report of its operations, including a statements of receipts and expenditures, a copy of which report shall be sent to each of the other stations provided for in this Act, to the Secretary of the Interior and to the Secretary of the Treasury of the United States.

SEC. 7. That nothing in this Act shall be construed to impair or modify the legal relation existing between any of the said colleges and the government of the States and Territories in which they are respectively located.

SEC. 8. That nothing in this Act shall be held or construed as binding the United States to continue any payment from the Treasury to any or all states or institutions mentioned in this Act, but Congress may at any time amend, suspend or repeal any or all the provisions of this Act.

J. P. JACKSON of Pennsylvania. Everybody recognizes that agriculture is the basis of national prosperity and success. If it is at a low ebb, we are all at a low ebb; if it is successfully managed, we are all more or less prosperous, provided other elements do not enter in to interfere. Our chambers of commerce, manufacturers, labor organizations, strive to improve the character of agricultural operations and to help to improve methods of marketing. Yet, although agriculture is basal, other and perhaps less basal industries must be handled efficiently. If a manufacturer

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of shoes uses 50 percent more labor than is necessary, if he wastes material or uses material ill-adapted to his purpose, you and I, whether we are farmers or not, must pay the bill. In other words, industry—agriculture, manufactures—the production in its finished form of all things that human beings use, must be considered as a cooperative unit.

Our agricultural experiment stations have done much to promote the effectiveness of our agricultural methods, to increase farm productivity and to lessen the waste of human energy; and engineering experiment stations can do for industry in general what agricultural experiment stations have done for agriculture, in steam, electricity, iron and steel, in the dyes, explosives, textiles, and in a thousand other ways. The field will be covered with our workers in the way it should be in respect to investigation and the acquisition of knowledge. There is not a community on the western prairie or in manufacturing Pennsylvania where an industrial experiment station cannot earn many times the equivalent of its cost. This has been proved by German and other foreign experience.

In my own work, in charge of the Pennsylvania Department of Labor and Industry, I have felt the constant need of such an organization, fully equipped and able to answer the problems with which our people must reckon. We have problems such as the one we found in one Pennsylvania town where there were places for all the men to work and none for the women to work; and in another Pennsylvania town where there were places for all the women to work and very few for the men. An industrial experiment station would be very helpful in overcoming such a condition, whereby the family unit cannot earn, as of right it ought, a maximum income. Similar situations, and others equally important, confront us in every state and constitute the reason for believing in a disseminated series of national experiment stations.

Senator Morrill had a great vision: He said to himself, "I want to help the industrial people, the workers, the hand workers and the brain workers, to have a place where they can get a practical, applied education, where they can get a higher mental training for the useful things of life and not merely for the professions; to have a place where experimentation of a practical order can be carried on; a place where information is gathered and disseminated." It was a great vision. These Land-Grant Colleges, children of his brain, have been powerful factors in converting our great scholastic universities into good, practical, useful educational centers. Indeed, these newer institutions, supported by the whole people, have blazed the trail for modern higher education.

We as a people have shaped that education as Senator Morrill dreamed it, as Congress enacted it, as the several States agreed to it. The agricultural experiment stations have got well under way and in their turn the agricultural extension services are disseminating information touching agriculture and home economics. Now, let us join as a unit, chemists, miners, mechanical engineers, agriculturists, to round out this great national-state system, so that all fields will be covered not only in education but in experimentation and in extension, so that the needs of all the people, and especially of all the working classes, will be met. To accomplish this purpose let us begin by establishing an experiment station in each land-grant college which will deal with other industries as the present stations are dealing with the agricultural industry.

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G. W. Bissell of Michigan. The McKellar bill, to which reference has been made, and the Newlands bill, which is now before us for discussion, have this in common, that they both provide in their phraseology for the building up of a separate organization for the initiation and maintenance of engineering experiment stations. The Newlands bill, which originated at the Berkeley meeting of this Association and of the Land-Grant College Engineering Association, is patterned very closely after the Hatch Act establishing agricultural experiment stations. I have collaborated in shaping the Newlands bill, and helped to get it to its present stage, yet I feel that instead of paraphrasing the Hatch Act it were better to amend it, modifying its phraseology sufficiently so that the ideals and purposes of the Newlands bill, in so far as they pertain to engineering, may be attained and appropriating an additional $15,000 for the purpose of carrying on engineering experimentation. It has been suggested that perhaps such a proposal might facilitate legislation. The substitution of an amendment to the Hatch Act in lieu of separate legislation should tend to induce a helpful spirit of cooperation between the various collegiate intramural interests. Agriculture and engineering have tended to draw together of late; they are less aloof in our institutions than they were in the past. These great interests should work together; and if, by means of the proposed augmented experiment station activities, engineering work may be brought under the same general roof as that in agriculture, much good will be accomplished and neither the one nor the other will lose.

A. A. Potter of Kansas. The war stricken countries of Europe are spending large sums to further industrial development, in preparation for peace. When peace is declared there will be great competition between the different nations for trade. Victory in this commercial war for industrial supremacy will depend upon science and research applied to industrial problems.

It is a well known fact that researches in engineering and in the other branches of the mechanic arts have been greatly neglected in the United States. Every thoughtful person is awake to the need of radical steps for encouraging industrial research in this country. Those who are looking towards the future are also convinced that such industrial research work must be started without delay.

The purpose of the Newlands engineering experiment station bill for systematic experimentation in engineering and in the other branches of the mechanic arts is analogous to that of the Hatch Act of 1887. It purposes to parallel the excellent work which has been carried on by the agricultural experiment stations. It introduces no new precedent. The Act of 1887 and this proposed enactment supplement the Morrill Acts and will aid this country in holding its own in the world struggle for commercial and industrial supremacy.

One of the first objections raised to the Newlands bill was that it proposed to create many scattered experiment stations. Some people favored a few large experiment stations rather than many smaller ones. This objection is met by Dr. W. R. Whitney of the United States Naval Consulting Board and director of the research laboratories of the General Electric Company, in the following language:

"If the amount of money represented by the Newlands bill proposal were centered in a single organization, it would not to my mind serve the

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purpose half as well. In the first place, it would not discover the men in our colleges who are now in a position to do advanced scientific work. It would cut out local interests and possible state appropriations and would not take advantage of the enormous amount of available apparatus in the colleges."

The Newlands bill makes large equipment available for general research at points where exist the raw materials, the men and the local problems. An experiment station in each state will be in direct contact with its local industries.

Those interested in institutions other than the Land-Grant Colleges seem to be opposed to the locational restrictions of this bill. These stations should be located solely at land-grant institutions for the following reasons:

1. They are federal as well as state colleges. The engineering experiment stations should be located at institutions already created by Congress. To do otherwise would establish a dangerous precedent and would engender political wars at every legislative session in states where separation obtains. The proposed bill introduces no new policy as to federal aid.

2. The results attained at the agricultural experiment stations prove that the land-grant institutions can be trusted to utilize such funds to advantage.

3. The leadership of the land-grant institutions in engineering education is such that they are entirely competent to do the work contemplated by the Newlands bill.

4. The location of the proposed experiment stations at the land-grant institutions will result in close cooperation between the engineering and the agricultural experiment stations. Such cooperation will prove beneficial to modern agriculture and result in the utilization of waste farm materials. The increased usage of machinery and motors on modern farms necessitates engineering investigational work. Road building, rural architecture, electrical engineering, drainage and irrigation and other lines can best be carried on at land-grant institutions, where the engineering experimenters can be aided by their colleagues in the agricultural stations.

5. Engineering research and scientific investigation are important factors, not only for the industrial development of a nation, but also as a means of military and naval preparedness in times of peace or war. The Morrill Act requires that military science be taught, and last year over 30,000 young men were thus taught. The land-grant institutions are extensive training schools for the army and play an important role in our program for preparedness. Agricultural and engineering experiment stations linked with military training form a strong basis for industrial and military preparedness.

It is suggested that the federal funds may be divided between several state institutions. Fifteen thousand dollars when divided into several parts become a mere bagatelle. Diffusion is waste.

The proposed bill has been criticized with some degree of justification on account of the lack of strong centralized supervision. If it is modified to provide for such centralized supervision, an additional appropriation should be made to cover the expenses necessarily incurred in connection with such supervisory work. The National Research Council proposes certain modifications in the Newlands bill in order to provide for this supervision and places the expenditure of the funds in the hands of a state board

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which is appointed by the National Academy of Sciences, and authorizes this board to select the institution where the work shall be carried on. In this form the bill ignores the claims of the Land-Grant Colleges and their earlier interest and activity. Any modification which would enable a state board or state legislature to locate the experiment station at another institution would seriously weaken the land-grant college system; and compromises will eventually result in the elimination of engineering at the separate land-grant institutions.

The insertion by way of an amendment of a clause which will link the military features of our colleges with the engineering research stations might be worth while. Consequently, at the hearing on the Newlands bill before the Senate Committee on Agriculture and Forestry, on June 24, I suggested the following modification of the first section:

"That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with engineering and other branches of mechanic arts and to promote the scientific investigation and experiment respecting the principles of applications of the mechanic arts, there shall be established under the direction of the Land-Grant College requiring military science and tactics of all male students in each State or Territory, established—".

It might be well still further to modify the bill so that the experiment stations may cooperate with the Army and Navy in carrying out the provisions of those sections of the Hay-Chamberlain Act dealing with the Reserve Officers' Training Corps.

Now is the psychological time for us to push the engineering experiment station bill to a successful issue. Our success depends upon the activity with which our constituent colleges will work for the measure. The majority of them have been lukewarm in their support. If properly organized, the enormous influence of this Association will overcome all opposition.

I have here a letter from a president of an institution, who in part says:

"The bill did not pass at the present session, and will only pass eventually when the Land-Grant Colleges act unanimously upon it, as they have done formerly in matters pertaining to agriculture."

The Executive Committees of the Association of American Agricultural Colleges and Experiment Stations and of the Land-Grant College Engineering Association should exert every effort in furthering the passage of the engineering experiment station bill. The various land-grant institutions should be visited and organized. The prominent research men of the country should be interested so that this important measure may have favorable consideration by Congress. Its passage will increase their ability effectively to serve their States and industries.

W. E. Stone of Indiana. In my judgment, the most important subject to be discussed at this meeting is this proposed legislation and the attitude this Association shall adopt toward it. In the original Morrill Act underlying our institutions, agriculture and the mechanic arts are coordinated. This Association is quite as much interested in the mechanic arts as in agriculture, if it represents adequately our institutions. Such legislation as is proposed is intended logically to carry out the intent of the Morrill Act. Any proposed legislation should adhere strictly to the principles in that

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Act, if we expect the institutions which we represent to prosper in the future. I believe that the Association should be more alert than it has been in the past to the importance of these principles; that any federal legislation which originates in this Association on behalf of these institutions should follow closely the original lines laid down in the Morrill and Hatch Acts; that we should resent as interference any attempt of an outside agency to legislate for us or to direct the course of our institutions.

I observe that whenever in recent years legislation is proposed in the interest of the Land-Grant Colleges, it immediately meets with a certain opposition in Congress, and usually this opposition can be traced to those State Universities not connected with the Land-Grant Colleges. I object to the opposition coming from such a source as an unwarranted interference with the proper development of our institutions. I hope the Association will instruct its Executive Committee to see to it that legislation in the interest of engineering experiment stations in the Land-Grant Colleges shall be as nearly as possible identical with the provisions of the Hatch Act. For my own part, I consider the principles involved in the proposed legislation so important and the opposition which has been made against it so threatening, that I would rather see no legislation at all relating to engineering experiment stations than to see these principles imperiled.

J. G. Scrugham of Nevada. I believe that it is very necessary that the Executive Committee be given full power to make such amendments and modifications in this bill as it deems wise in the interests of the Land-Grant Colleges. I believe, further, that some advantageous form of cooperation might be arranged with the National Research Council. The scientific eminence of its membership and the purity of their motives cannot be questioned. Its chairman, Dr. George Ellery Hale, says wisely and well:

"The one desire of the National Research Council is to promote research in science and engineering, and the Newlands bill should help materially in this direction if its provisions are sound and if it can command the support of Congress. The problem is to secure an arrangement which will satisfy both sides. . . . I have purposely refrained from reaching any conclusion regarding the best wording of the bill; but I am anxious to see it passed in some form, as government aid should surely be given to research in all states. The National Research Council does not desire, however, to become involved in any controversy, or to have any part in the disposition of the funds unless there is a clearly expressed wish for its services."

Prof. R. A. Milliken, chairman of the committee appointed by the National Research Council to consider the Newlands bill, writes:

"The committee was appointed because of Senator Newlands' suggestion to Dr. Hale that the friends of the main purpose of the bill should in some way be brought into agreement, and it was composed only of men who were connected with institutions having no immediate interest in the legislation proposed. It has suggested in its report merely the lines along which agreement seems to it likely to be possible, and it is anxious before going further to learn the attitude of the Land-Grant Colleges upon these main points, all details being postponed for later discussion.

"If the Land-Grant Colleges are likely to oppose any essential modifications of the bill as it now stands, then it is my personal judgment that the National Research Council will be disposed to withdraw entirely from the

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discussion and let the legislation take such course as it may, and that merely because it will feel that it is unwise for it to be mixed up in the political pulling and hauling which is likely to follow, with little or no result in the end. Indeed, there is a strong feeling already in the council that, while its advice and direction should always be freely given whenever the interests of research are to be advanced, it must not appear to be promoting legislation of which it, itself, might in any way be thought to be a beneficiary. If, therefore, in this instance, the National Research Council can act as a unifying and harmonizing agency, as it was thought it might when the committee was appointed, it will devote itself unsparingly to the task, but I do not think that it will allow itself to become one of a number of contending parties.

"The committee is, therefore, very anxious before proceeding farther to get from the Land-Grant Colleges a statement of what their general position is going to be upon the main issue raised."

One of the most consistent, and earnest advocates of the Newlands bill is Dr. W. R. Whitney of the General Electric Company Research Laboratory, who is a member of the Naval Consulting Board. He has obtained for this measure the endorsement of many industrial and scientific organizations. His contribution to the discussion is critical but none the less constructive. He writes:

"It is logical to expect some centralized arrangement for directing, planning or coordinating any such work as research, particularly when, as in this case, the Federal Government is to make grants to be spent in isolated places. I should try my best to arrange things so that what is done in one state will not be duplicated in another, or some project shall be planned in one state which engineers in another state have found to be impracticable. I think that the Federal Government ought to hold the veto power in general, and in all cases have an advisory unit on whatever board or committee is responsible for the location of the undertaking and nature of the work. I could not imagine turning over such federal representation to any single bureau director and therefore I favor the idea of representation from the National Research Council in addition to the Secretary of Commerce."

In view of these representations, I believe that the Executive Committee should be empowered to confer with and, if possible, to enter into some agreement with the National Research Council.

We need the support of the great engineering and scientific organizations of the country and we need a certain amount of publicity; but the ultimate passage of this measure can only be obtained by the wholehearted and aggressive support of this Association. There should be organized in each congressional district a committee of engineering graduates of the Land-Grant Colleges whose duty it should be to see to it that representatives understand what the Newlands bill means. Above all, it is important that we present a united front for the reason that other industrial and scientific interests are contemplating the promotion of a measure in which the interests of the Land-Grant Colleges and State Universities will receive scant consideration.

P. V. Stephens of New York. I am a consulting engineer in power and industrial projects and have been at work for four years establishing a state-supported engineering experiment station at the Georgia School of

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Technology. When this bill was presented, we naturally became interested, and, upon investigation, found opposition from Land-Grant Colleges, from State Universities and most serious opposition from governmental departments. In view of this situation the question pointedly arose, how should this bill be shaped so as to be most likely to pass. That some such bill should pass goes without saying, because we all recognize that fundamentally it is one of the most needed pieces of legislation now pending in Congress. After discussing the matter with several interested parties, I prepared two amendments which I submitted to the Land-Grant Colleges generally.

The first amendment proposes that the legislature of each state be authorized to select and appoint the proper institution where this work shall be conducted. We cannot hope for federal recognition unless the bill promises a high degree of efficient service. I shall not take part in the discussion as to whether the work should be done in any given case at the Land-Grant College or at the State University, but as an engineer, with all of my work based upon efficiency, I am bound to contend that, speaking broadly, it should be done at the institution best equipped and organized to do it. If the legislature of any state should prefer to establish the engineering experiment station at some state-supported institution other than the Land-Grant College, which may not be so well fitted as another to do its work, then it is a question whether we should, by this bill, prevent the legislature from so directing the work in its own state to that institution, where it will be conducted with the highest degree of efficiency and without duplication of expensive equipment and of men. Institutions within each state should present their claims to the legislature, which should be authorized to designate the institution where the station should be established.

The second amendment proposes that the Secretary of Commerce instead of the Secretary of the Interior be delegated or authorized to supervise the work of these stations. The greatest engineering experiment in the world is located in Washington. I refer to the Bureau of Standards, which is under the jurisdiction of the Secretary of Commerce. If these proposed stations are similarly related to the Secretary of Commerce, their work will be correlated and coordinated with the great government research work which the Bureau of Standards is doing. This bureau has long desired to establish branch engineering experiment stations but has lacked the means wherewith to do it. The director of the Bureau of Standards, Dr. S. W. Stratton, who is recognized as one of our greatest authorities, stands ready to further this state research work to the best of his ability if it is supervised by the Department of Commerce. The Bureau of Standards would be immediately responsive and would be a powerful factor in the efficient inauguration and prosecution of this industrial research work. Many of the land-grant college officials with whom I have been in correspondence heartily endorse these suggested amendments.

A third proposed amendment that I have not yet presented to the Land-Grant Colleges, I now present for your consideration. We have in the Department of Agriculture, the States Relations Service. It focalizes, utilizes, concentrates and diversifies the general work of agriculture in the Land-Grant Colleges, wherever it is necessary. It promotes a valuable intercourse of ideas and directs generally the work of the agricultural experiment stations. A similar organization would serve an equally good purpose in connection with engineering experiment stations. This is vitally im-

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portant. Hence, there should be incorporated in this bill some provision establishing and supporting an Engineering Industrial Bureau bearing a similar relationship to the engineering experiment stations that the States Relations Service bears to the agricultural experiment stations. Some such bureau will eventually be created and should be established immediately. Favorable congressional action can be secured more easily now than later. I recommend that the following amendment be incorporated in the bill.

"That for the purpose of paying the necessary expenses of adequate supervision and cooperation by the Department of Commerce, the sum of $50,000 per annum is hereby appropriated to the Department of Commerce in order that the Bureau of Standards shall not only assist in the prosecution of said research and other engineering experiment work in the respective stations, but shall also, as far as possible, give the facilities of the bureau to those engaged in the work of the said research stations especially when the lack of research equipment in any of said stations would interfere with or delay the prosecution of important research or when the facilities of the Bureau of Standards are especially adapted to any special line of research, the successful prosecution of which may be highly beneficial to the people of the United States."

This amendment proposes to make available in the several States the equipment of the Bureau of Standards. The Bureau of Standards at the present time has no funds for use in this work, and if this cooperation is contemplated, special federal funds must be supplied. This opportunity of securing such available aid should not be lost, for the reason that $15,000 is but a mere starting point. Our best endeavors must be employed with a view to secure additional state appropriations.

Let us forget any past differences and work together. This is an engineering research proposition to be considered only on the basis of efficiency and economy. If thus based, substantial support may be secured not only from Congress but from the great engineering societies and industrial organizations.

F. L. McVey of North Dakota. I do not wish to speak upon the Newlands bill as such, but upon some of the larger fundamental questions involving the whole problem of education in the United States; and this powerful Association sooner or later must take the view that education is a national question and not a state question or an institutional question. We are apt to think in terms of sections, or even of counties and small districts instead of in terms of the Nation; but there are 48 States in this Union, States which, acting in accord with the principles of American government, have attempted to develop their own educational ideals, methods and systems.

During the last three years three pieces of federal legislation of vital and wide-spread influence and power have been either enacted or proposed; the Smith-Lever Act, the Newlands bill and the Smith-Hughes bill. This organization, every organization dealing with educational affairs, should ponder the question whether further legislation should proceed upon the piecemeal basis, little by little, for special interests, without the consideration of the great, broad question of national education as it exists in this country. It is not the question as to the appropriation of $15,000

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to a specific type of institution, but the broad, big question of education from the national point of view.

There are 20 States which have essayed in one way or another, usually by constitutional provision, to establish educational systems for their own purposes; namely Maryland, Virginia, the two Carolinas, Alabama, Mississippi, Indiana and Michigan east of the Mississippi river; Iowa, the two Dakotas, Kansas, Oklahoma, Texas, Montana, Colorado, Utah, New Mexico, Washington and Oregon west of the river. These states have seen fit to establish State Universities apart from their Land-Grant Colleges. Federal legislation of the past 30 years, and these various proposals looking towards further federal legislation, have constantly cut across the plans and schemes of these States. In many of them, educational surveys are either in progress or have been completed, by which the people are earnestly trying to solve their educational questions; and the Federal Government now comes in, without regard to local conditions, and proposes blanket legislation, country-wide in its influence, breaking down the plans of concentration or separation or coordination that are being developed in these various states. I beg to differ with President Stone as to whether or not the Newlands bill is my business or that of men connected with State Universities, or that of men connected with all kinds of education. I contend that it is a part of my business. When a measure like the Newlands bill is proposed which touches 48 States, the point of view of the separate State Universities should be considered by Congress as well as that of the Land-Grant Colleges. I appeal to you to look with favor on the resolution touching this matter which has been adopted by the National Association of State Universities, which, I trust, may be read to you, following my remarks. I urge you to adopt a broad-minded, liberal point of view of these educational questions, to look upon them as national in scope, to regard them from the point of view of the men who are fundamentally interested in education itself, with an outlook not only of the morrow but of the more distant future.

W. O. Thompson. The resolution passed by the National Association of State Universities regarding the Newlands bill, referred to by President McVey, reads as follows:

"The special committee to consider the Newlands bill and other resolutions and items referred to it begs leave to report as follows:

1. That this Association endorses the principle of federal grants in aid of engineering experiment stations.

2. That the Association endorses the principle of cooperative control between the Federal Government and the States participating in the provisions of the act providing for the establishment and maintenance of experiment stations.

3. That ten of these stations shall be established the first year, and not more than five any succeeding year thereafter; that the location of these stations shall be by a board consisting of the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, and approved by the President of the United States. In all cases the location of the station in any state as determined above shall not be effective until approved by the Governor of the State.

4. Your committee also recommends that the National Association of State Universities invite the Association of Land-Grant Colleges and Ex-

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periment Stations and the Association of State Normal Schools to unite in the formation of a joint committee for the consideration of the entire problem of federal aid in support of education, and that the joint committee report to a joint meeting of the three Associations in November, 1917.

W. O. THOMPSON,
FRANK L. MCVEY,
HENRY SUZZALLO,
BROWN AYRES,
W. L. BRYAN."

Item 4 looks towards a federation of all state-supported institutions in a great onward movement in education. It will be recalled that the state normal schools are now supported by the States, and that the vocational educational bills, beginning with the Page bill and including all its successors, have suggested these schools as proper centers in which federal aid should be located. No one familiar with the facts as to aid for the Land-Grant Colleges will overlook the fact that there is some duplication, and probably there are some unfortunate features in some of these bills. The Association of American Agricultural Colleges and Experiment Stations believed that it ought to push the agricultural extension bill and did not desire to become entangled with the details of these other bills. Its judgment was finally enacted into law. It is perfectly obvious that the next step in education will be in the direction of advancing vocational education; but it is equally clear that the country has not yet got together on a definite and well-conceived program.

In discussion before the committee of the National Association of State Universities, it was disclosed that doubt would arise in several states whether the benefits of this act could be realized in the near future. This was a determining factor in the agreement that there should not be imposed immediately upon all the States a burden that possibly some of them might not be in a position to assume. Furthermore, it appeared that certain constitutional provisions in some states might make it impracticable to locate a particular institution at present.

We all recognize the difficulty of adjusting these educational problems. The fact that three classes of institutions now having state support, and some of them federal support, are seeking further federal aid, seemed to some of the members of the National Association of State Universities to warrant an attempt to federate these three great activities into one, in the interest of an onward movement in education. This proposition implies no opposition to scientists or engineers or others in their plans looking towards the development of our national industries and resources. It was hoped that within the coming year these proposed committees could so consult as to bring the three classes of institutions into a confederated convention, held either before or after the convention of this Association, in which we could in man fashion look into these educational problems.

It is proposed further that a committee of this body join with a committee of the National Association of State Universities in a meeting in New York on Saturday morning next with a committee representing the National Research Council, on the Newlands bill, and at that time to present these resolutions, as well as others which may be adopted by this Association, and to set forth the gist of such discussion as may take place during the present Convention. It is hoped that this Association will authorize the appointment of such a committee.

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It is hoped, further, that, agreeable to item 4 of the resolution of the National Association of State Universities, a committee of five may be appointed to cooperate with these other committees so as to bring about a larger convention for the full discussion of these problems. The National Association of State Universities has long recognized the legitimacy of congressional criticism upon the lack of unity among educators touching the vocational education bill. We do not, perhaps we could not, agree for lack of intelligence concerning it, because there was no body through which there might be expressed the actual conditions in individual states. I know, for example, that the Page bill would not have fitted the situation in Ohio; it is quite probable that it would not have fitted the situation in other states. I am not sure that the Smith-Hughes bill will fit the conditions in each of the 48 States. No measure should be passed unless, reasonably construed, it can be effectively utilized in the various states. These are the larger problems of education to which President McVey has referred, and which I am sure are in your hearts. There is no opposition, no conflict anywhere as to the great underlying principles. Opposition develops only when we come to the matter of application, in the matters of legislation.

In this connection it may be well to remind the Association of the action taken last year touching the then proposed Newlands bill, reading as follows:

"*Resolved,* That this Association reaffirms its belief in the advisability of the establishment of engineering experiment stations and of federal legislation to that end, and instructs its Executive Committee to urge congressional action whenever in its judgment such a step seems advisable." (Twenty-ninth Proceedings, page 152).

I may say, further, that I met with Senator Newlands and others in Congress. I said to him and to Senator Gore that in my judgment the attitude of the engineering societies and the State Universities should not be forgotten or its importance underestimated. Senator Gore said to me in so many words that the Land-Grant Colleges were federal institutions, that the contemplated appropriation should go to them only, and that he would listen to no compromise. I told him that such an attitude would be gratifying to the Land-Grant Colleges, but that the State Universities felt they had rights and desired a bearing before a definite decision is reached; but he showed no interest in my statement. I was told that there would be no difficulty in reporting out this bill; but as a matter of fact serious opposition developed, and I was told by Senator Newlands that it could not pass.

Now, this bill cannot be passed now or later unless unified action is secured on the part of the educators of this country. We must formulate a program that will appeal to them. If it be the Newlands bill, we must all get behind it. I would say in passing that the Executive Committee has never been disloyal in the exercise of the power placed in its hands, and I am sure that the present and future committees will uphold fairly and squarely the action of the Association; but we urge a well considered program and deprecate hasty and ill-advised action. The entire matter should now be placed in the hands of the Executive Committee or some special committee, and its report made a special order of business.

On motion, it was voted to continue the general discussion at the evening session and to request the Executive Committee to report a recommendation for final action at its convenience.

On motion, a recess was taken until 8 P. M.

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EVENING SESSION, WEDNESDAY, NOVEMBER 15, 1916

The Convention was called to order at 8 o'clock P. M. by the vice-president, W. M. Riggs of South Carolina.

THE VICE-PRESIDENT. It is not necessary, before this audience of scientists, to make any extended introduction of the speaker of the evening. It gives me pleasure to present Director Charles E. Thorne of Ohio, who will deliver the annual presidential address.

PRESIDENTIAL ADDRESS

BY C. E. THORNE

THE PROGRESS OF EDUCATION AND RESEARCH IN AGRICULTURE

In coming before you this evening it is my first duty to acknowledge, and this I do in no perfunctory spirit, my sincere appreciation of the high honor you have conferred upon me by selecting me to preside over the deliberations of this Convention. The presidency of this Association has always been a position of great honor, but as the Association grows in the influence which radiates from the accomplishment of high purposes faithfully executed, the responsibility of those who are called upon to assist in the direction of its work becomes constantly greater.

As one of the few men now living who have participated in the growth of this Association from birth through infancy and adolescence to maturity, I trust that I may be pardoned for a brief indulgence in a reminiscent mood.

Thirty-one years ago there met in Washington a group of men representing the agricultural colleges of the United States and other institutions organized for the promotion of agriculture, who had been called together by Norman J. Colman, then National Commissioner of Agriculture, to consider ways and means for rendering more effective the work of scientific education and research in agriculture.

This convention was held on July 8 and 9, 1885, and while many questions of importance were earnestly discussed, the great matter that came before it was the bill for the establishment of agricultural experiment stations in the different States, which had been introduced in Congress by Mr. Cullen of Illinois, and which received its unanimous indorsement. The Cullen bill failed to pass that Congress, but became a law two years later, under the championship of Mr. Hatch of Missouri, with some minor changes and one addition of importance.

The convention appointed a committee, consisting of Presidents George W. Atherton of Pennsylvania, Edwin Willitts of Michigan and Stephen D. Lee of Mississippi, to act in cooperation with the Commissioner of Agriculture in furthering the passage of the experiment station bill and with authority to call another convention. This call was issued in the summer of 1887, and on October 18 the convention reassembled in the rooms of the Department of Agriculture at Washington, and adopted a name and a constitution.

I doubt whether even the most enthusiastic sponsors of the Hatch Act had an adequate conception of the real significance of the movement

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this measure was destined to set on foot. The enactment providing for the establishment of the colleges of agriculture and mechanic arts had been on the statute books for a quarter of a century. A few colleges had been organized and were being conducted in sincere conformity with the spirit of that law, a law unquestionably intended to provide an educational system which should meet more fully than was done by the existing systems the needs of those who must make their living chiefly by the labor of their own bodies; for in 1862 the implements which had been employed in husbandry since man first learned the use of metal were only beginning to be displaced by modern machinery.

Especially was this true in New England, for the improvements in tillage and harvesting machinery made their first appearance on the more level lands of the then western states, and the industrial picture in the mind of the author of this epoch-marking law was that of a farmer reaping his grain with an implement made for him by the blacksmith at the nearest village, and drawing it to market on a wagon made by the wheelwright of the same village, while his grain was ground into meal at a small mill driven by the water of a neighboring stream, and his clothing, if not spun and woven in his own home, was largely made in another little mill on the same stream.

The farmer, the blacksmith, the wheelwright, the carpenter, the miller, the weaver, and the merchant, were members of the same church. They met together in town meeting and their children attended the same school. What could have been more natural than that Justin S. Morrill, himself blacksmith, farmer and merchant, should have had such a picture in his mind?

But Senator Morrill must have had some premonition of the industrial changes which were then just beginning. The cotton mills of New England were harbingers of the enormous concentration of capital in manufactures which has since taken place; the railway and telegraph were sufficiently perfected to show that a revolution was at hand in the methods of transportation and communication; the reaping machine was beginning its work on the western plains, and its manufacture was taking men from the wheatfields to the shop. And from across the ocean came whisperings of other discoveries than those of mechanical invention; Liebig and Boussingault had for twenty years been reporting the results of their studies of the composition of soils and plants; Johnston had written his "Elements of Agricultural Chemistry and Geology"; and to the man whose head was above the level of common humanity, to him who since history was written has been called the Seer—the see-er—it was evident that the sun was rising upon a new day in human progress.

It is not to be imagined that Senator Morrill had any clear prevision of the stupendous changes which were to take place in industrial life. That he should have framed a measure which should adapt itself so perfectly to these changes is one of the evidences that in these days, no less than in the days of the ancient prophets, men are made the instruments for the performance of work planned and directed by an infinitely greater wisdom and clearer vision than their own.

But in many instances those charged with the administration of the Morrill Act had a very inadequate conception of its function. Trained in the traditional system of education which had come down through the centuries, they failed to perceive the significance of the changes in economic

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and industrial conditions which were taking place around them, and their endeavor was, not to adapt their teaching to these new conditions, but to use the Morrill funds for the support of the system of education to which they had been accustomed.

Even those who most clearly realized the true import of the Morrill Act were seriously handicapped in their efforts to carry it into effect by the lack of a body of definite knowledge upon which to construct a system of education calculated to meet the requirements of the changing conditions of industrial life. In the case of the mechanic arts, the difficulty was not so great as in that of agriculture, for mathematics, the basis of these arts, is the oldest of sciences, and it was possible to provide at once for systematic instruction in physics and in mechanical, mining, and civil engineering, and in several of the great agricultural States institutions were organized with strong courses in mechanics and engineering, conducted in each case under several professorships, while one or two men were supposed to be sufficient to cover the whole field of agriculture.

An an illustration, in 1880, in one of those institutions there were five professorships for the teaching of geology, general chemistry, mathematics and civil engineering, physics and mechanics, mining and metallurgy, while one man was expected to teach the subjects now included under agronomy, animal husbandry, veterinary science, agricultural chemistry, and structural, systematic and economic botany, and also to occupy his leisure time in the superintendence of the college farm and in lecturing at farmers' institutes. It is not surprising that out of a total of 118 graduates at this institution, up to and including 1887, but two had taken the degree of Bachelor of Agriculture, while 33 had taken degrees in engineering.

Up to this time there had been very little inducement to the young man whose heritage was limited to intellectual ability to prepare himself for the teaching of agriculture. With only one school in each State that made any pretense to agricultural instruction, and with such an example as the one I have described, in which one man was expected to teach all the applications of scientific knowledge to the work of the farm—and this instance was by no means an exceptional one—it required a high degree of faith and courage to justify forsaking the old and tested lines of professional work for this new and untried calling.

Moreover, the progress which agriculture was making was practically altogether along mechanical lines. By 1887 the sickle and flail had been replaced by the automatic harvester and steam thresher, each machine doing the work of many men, and each requiring for its management a considerable degree of mechanical skill and training, while a large proportion of the men who had formerly reaped and threshed the grain with sickle and flail were now drawn to the machine shops to manufacture the modern farm machinery. The opening of the western cattle ranges and great wheat farms by the transcontinental railways had made it cheaper to sell the old eastern farm, robbed of its natural fertilility by several generations of uninformed and improvident husbandry, and establish a new homestead on the virgin soil of the West, to be had almost for the asking, than to improve the depleted soil of the old farm; and consequently the value of farm land east of the Mississippi and north of the Ohio, which had steadily risen up to this time, now took a downward course, thousands of farms passed under the sheriff's hammer, bringing but a fraction of the value at which they had once been held, and a period of stagnation and depression

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in agriculture set in which lasted for nearly 20 years. Under such conditions it is not surprising that mechanics and engineering offered greater attractions to the farmer boy than the vocation of his father.

But here again came the work of the Seer. A few teachers saw the possibility of coordinating the empirical data relating to agriculture into an orderly body of scientific knowledge by means of experimental studies, conducted in field and laboratory; a few farmers had a vision of the immediate help which such coordination might be to them in their work; and out of this double vision grew the movement which culminated in the enactment of the national law, establishing the American agricultural experiment stations.

The agricultural experiment station is the necessary and indispensable complement to the college of agriculture, for the experiment station is both the crucible in which theories are tested and the fine gold of truth is separated from the dross of error, and the instrument of research by which further progress is made into the realm of the unknown.

The geologist studies the distribution of the rocks over the surface of the earth and the processes by which they are converted into the basis of soil; the botanist studies the distribution of plant life upon the globe and the preferences of different species for different geological formations; and the chemist studies the composition of rocks and soils and plants and suggests reasons for their interrelations; but not until geologist, botanist and chemist have joined hands in careful investigations made under the conditions of control which only the experiment station can offer, can we have that definite, exact and comprehensive knowledge of the processes through which the rock is converted into bread which is essential to the highest degree of human development and progress.

This concept of the experiment station, however, was far from the minds of some who were called upon to administer the new work, and as the Morrill fund had been sometimes diverted to the support of the traditional education, so the Hatch fund was coveted by the reactionaries, and where it could not be directly diverted to their purposes, the same end was accomplished indirectly by charging the experiment stations exorbitant rentals for college lands and by consuming the larger part of the time and energies of investigators in routine teaching. Gradually, however, these abuses have been largely eliminated. This Association, called into being for the purpose of organizing and directing a new enterprise in the world, has steadfastly worked for the protection of the Hatch fund from improper use, and this effort has been ably supported by the Office of Experiment Stations of the United States Department of Agriculture, which office has quietly but persistently and effectively insisted on the true interpretation of this epoch-marking act. Never was name more appropriate to the personality of the man and to the character of his work than that of him who for so many years had charge of this office.

When the Hatch Act became a law there were 17 experiment stations in operation in 14 States, the oldest of which had been in existence for 12 years. This law made possible the organization of such a station in every State, and coming, as it did, at such a period of lack of interest in agricultural education as I have described, it found the country unprepared to furnish men qualified to conduct scientific research in agriculture in sufficient number to meet the requirements of the new work. The consequence was that much of the work undertaken during the earlier years was crudely

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planned and imperfectly executed; but, crude and imperfect as it was, it was a sincere reaching forward and upward towards the truth. Scientific research in agriculture was a new enterprise in the world; its methods had to be worked out from the beginning, for the few experiment stations which had been established at the time the Hatch Act went into effect had been in existence for too short a time to have more than made a start in the work.

By 1897, however, the experiment stations in 20 of the States had secured the confidence of their constituencies to such a degree that these States were willing to supplement the national funds by appropriation to their experiment stations totaling $287,176. Ten years later, 34 States were contributing a total of $770,016 to the support of their experiment stations, and by 1914 the state support had increased to $2,574,605, in 38 States, while a few of the other 10 States seem to have been making some indirect provision for their stations. In 1897, 698 persons were engaged in the work of the experiment stations; by 1907 this number had increased to 1,098, and by 1914 to 1,852.

Nor have the colleges suffered because of the prosperity of the stations. In 1897 the total revenues of the American Land-Grant Colleges amounted to $5,178,580; in 1907 to $14,560,537, and in 1912 to $25,967,130—a gain of nine millions in annual support during the ten-year period, 1897-1907, and of a like amount during the five-year period following. In 1897 these colleges listed a total of 4,284 students in their agricultural courses. By 1907 this number had grown to 10,311, and by 1912, to 21,427. The one college to which I have referred, as having graduated two students in agriculture up to 1887, had a graduating class in its four-year course in agriculture of 209 in 1916, and 80 men are now required to teach its undergraduates in agriculture—80 men doing the work that one man was expected to do 40 years ago. In other words, within 15 years the total revenues of the Land-Grant Colleges and the number of their students in agriculture have each been multiplied by five, half this increase taking place during the first ten years and half during the next five years.

These statistics are evidence of the greatest revolution in educational methods that has taken place in all the history of the world; but they tell only part of the story. Not only are students crowding the halls of our colleges of agriculture so rapidly that it taxes every resource to provide for them, but secondary schools of agriculture are springing up all over the land; departments of agriculture are being established in denominational colleges, and in city, as well as rural, high schools; and persistent effort is being made so to systematize the work of the common school that the educational training of the rural child shall be so molded as to prepare him most effectively to adjust his life to the conditions of his environment.

In this revolution a leading position must be accorded to the experiment station. DeSaussure, Davy, Liebig and Boussingault were the Columbuses, Vespuccii, Cabots and De Sotos of scientific agriculture, but their discoveries possessed little more than academic value until confirmed and coordinated by the practical tests of Lawes and Gilbert, von Wolff and their followers; and it was not until the American experiment stations had demonstrated the elemental relationships between soil and plant and animal in terms and by methods which the farmer could understand and follow, that the colleges of agriculture began to fill up with students.

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So long as agriculture was merely a handicraft, in which brawn counted for more than brain, so long as it was chiefly a mechanical industry, for which the training required was that necessary to the handling of ordinary machinery, there was little inducement to the young man to spend four to six years in college in preparation for its pursuit; but with the demonstration that in agriculture there is opportunity for the exercise of the highest intellectual faculties at least equal to that offered by any other profession, either on the farm or in the rapidly widening field of scientific research and teaching, in the experiment station, the college of agriculture and other schools of agriculture, and in the latest form of agricultural education which is being organized under the Smith-Lever Act, the demand upon the colleges of agriculture has suddenly outrun their ability to meet it, and unless great care is taken the pressure for immediate help will be met at the expense of future service.

Ten years ago the Land-Grant Colleges were practically the only schools in which instruction was offered in the relations of natural science to agriculture. It was therefore necessary that these colleges should offer the most elementary instruction in these relations; but now secondary schools of agriculture are being established and agricultural departments are being organized in high schools and denominational colleges. I believe that the Land-Grant Colleges should encourage this movement by every means in their power, and should bend their own energies and resources more and more to the training of teachers and investigators.

It is a fine sight to see a thousand boys and girls studying together the elementary principles of agriculture and domestic economy in a state agricultural college; but it would be a far finer sight to see a hundred thousand boys and girls studying these principles in a thousand township high schools, under the guidance of graduates of an agricultural college, and to see in that college a smaller group of more mature young men and young women, who had come there to prepare themselves for this work. The vision is an optimistic one, but I have faith that it will be realized when the colleges make efficient use of their opportunities, both for research and extension work.

But the vision will not be realized if research is allowed to languish. Science cannot stand still. Each extension of the horizon of our knowledge only expands the boundary of the unknown, and makes yet more imperative the necessity for further research, and the institution which contents itself with present knowledge will soon find itself forgotten.

I have referred to the tendency to subordinate the experiment station to the class room. Because the work of the investigator is absolutely essential to progress in teaching it seems the most natural thing to call on him to teach. Teacher he assuredly must be, but his province is to teach the teacher, and the institution which sets before him the task of teaching the undergraduate is wasting his energies and missing its opportunity.

In another respect the true function of the experiment station has been misunderstood and its energies misdirected. The stations have performed an invaluable service through the application of the methods of scientific research to the uncovering of fraudulent practices in the compounding of fertilizers, feeding stuffs, human foods and medicines, and to the working out of methods for the control of injurious insects and the diseases of plants and animals. This work has been the necessary foundation upon which to construct an effective system of protective legislation;

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but to require the investigator to lay aside his instruments of research and execute the laws which his investigations have made practicable is like calling upon an Edison to run a trolley car.

The ultimate purpose of the agricultural college and experiment station is to increase the acre's yield, in order that an increasing population may be adequately fed and clothed. That this purpose cannot be accomplished through mechanical invention is shown by the fact that the tremendous advance which has been made in the mechanics of agriculture during the last 60 years has added scarcely a bushel to the acre's production. A farmer may plow and sow and cultivate and harvest many more acres today than he could have done 60 years ago, but the statistics of crop production show that the very small increase in the yield of crops in America which has been accomplished during this period is due chiefly, if not altogether, to other than mere mechanical improvements.

On the other hand, the work of the experiment stations has demonstrated the practicability of very largely increasing present yields, through the aid of modern scientific discovery, by measures within the reach of any man of average intelligence, and at a cost which will be recovered with large dividends in the increased production.

This demonstration has required time for its accomplishment, because it has depended, not on the adaptation of well known mechanical laws to the purposes in view, but on the discovery of principles governing the nutrition of plants and the study of the effect upon the crop of different soils and of cycles of climatic change.

From the day when the first reaping machine demonstrated that the work of the sickle was ended, the propaganda of agricultural machinery has never lacked for money, or for men ready and willing to visit the farmer on his farm and with convincing eloquence to persuade him to buy. Back of this propaganda has been a great manufacturing industry, protected and fostered by tariffs and patent laws, and thus abundantly able to care for itself. On the other hand, the experiment station has worked in its laboratories, sometimes supplemented by a farm, which has usually been selected without any intelligent regard to its adaptability to the purposes of scientific research, and on which, consequently, the results of field experiments have often been contradictory and misleading, because of lack of opportunity to duplicate the tests and thus discover the sources of error. The station has published the results of its work and has offered to send its publications free to any farmer who would ask for them, with the outcome that less than one farmer in four has been willing to risk the investment of a postal card in such a request.

The progress of the stations, notwithstanding this handicap, has been due to the fact that the few farmers who have studied this work have been convinced of its usefulness. It is safe to say that if the manufacturers of agricultural machinery had followed the methods pursued by the experiment stations in advertising their wares the list of millionaire manufacturers would be a very much smaller one than it now is.

The Smith-Lever Act is a movement toward remedying this defect in organization; an act fraught with tremendous possibilities for good, if properly administered. But this act, like the original Morrill Act and the Hatch Act, for a time must fall short of its possible benefit to agriculture because of the dearth of men properly trained for the contemplated work. The administration of the Smith-Lever Act is lodged with the colleges

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of agriculture, which means that the work is to be that of the teacher, and it is being organized in the expectation that the teaching will be extended not only to the young people of the farm but to their parents as well. In so far, and only so far, as this teaching is built upon the solid foundation of demonstrated fact will it be successful, and the only place where this demonstration has been or can be made in agriculture is the experiment station.

After all is said, it is to the soil and its secrets that we must turn for the material progress of the race; and when material progress ends the intellect also will stagnate.

In conclusion, I would impress upon your minds the fact that you are charged with the piloting of the mightiest engine of human development and progress that has been loosed upon the earth since the advent of Christianity. Upon the wisdom with which you and those who follow you perform this work depends the answer to the question whether future generations shall find sufficient food and clothing. In supporting this work you are not only preparing the way for an incalculable increase in the number and comfort of the world's population, but also for an immeasurable expansion and uplifting of humanity's intellectual horizon.

THE PRESIDENT. The continuance of the discussion with reference to proposed legislation to establish engineering experiment stations is now in order.

W. F. M. GOSS of Illinois. An interest is awakening in scientific research such as has never before appeared. Everywhere men in the industries, colleges and technical schools are discussing the possibilities of extending their inquiries. Naturally, any proposition looking to increased support for engineering research attracts the attention of many different people. Now it happens that through the inspiration of members of this organization, a bill was launched to promote engineering research in the Land-Grant Colleges by federal appropriations. This bill has received certain attention from members of this Association, but apparently the supporting influences have not followed it closely, and, as a result, the bill has attracted the attention of other agencies and is receiving the impress of other influences.

I am told that Senator Newlands, its author, called the attention of the National Research Council to it, with the statement that the bill was not likely to pass. He suggested that that body undertake to get behind it and, if necessary, amend it in such way as to make it go. The president of the National Research Council referred the bill to a committee of three, no one of whom was a member of this body or a representative of a Land-Grant College. This committee suggests two amendments, the purpose of which is to provide an appropriation for research in the several states under the administration of the Secretary of the Interior, as represented by the United States Bureau of Standards, through local boards which constitute to all intents and purposes new institutions for research in the several states. I do not oppose any one who may desire to promote such a movement. Any properly organized research agency should be welcomed. But I maintain that these proposed amendments remove the contemplated bill from the immediate interest of the Land-Grant Colleges; they transfer a movement started in the interest of engineering education in these institutions to another setting, and dedicate it to other purposes. It is ob-

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vious that when thus removed to another setting, however important that setting may be in itself, the bill ceases to be the child of this Association.

It seems to me that the conception of the engineering division of this Association in bringing forth this bill was a proper one, notwithstanding the criticism that is being urged against it. This criticism is to the effect that in certain states the Land-Grant Colleges may not be the most effective instrumentality for developing engineering research. This criticism may be well-founded, but nevertheless the Land-Grant College is a worthy instrumentality. If it is not the best, this is the more reason why the Federal Government should do what it can to improve its standing. The institutions to which the agricultural experiment stations were entrusted in 1887, were not then fully manned and entirely ready to discharge the responsibilities thus thrust upon them; but a beginning had to be made, and in time the agencies measured up to the responsibilities imposed. History will repeat itself. Money appropriated to the proposed engineering experiment stations in the Land-Grant Colleges will not be wasted. There may be low efficiency in the beginning; but low efficiency under such conditions is not waste. Beginnings must be made in engineering research as in other matters.

Again, objection is raised on the ground that the separate State Universities are interested; it is even urged that their rights are infringed by the bill. Of course, the State Universities should be interested, for the matter at issue constitutes a great public question; but surely when the matter is rightly understood, no broad-minded university president will object to a movement designed to strengthen an educational and scientific instrumentality within his State. If the thing is good in itself, it should stand. If certain of the state institutions need to perform functions in the line of research which is to be provided for by federal enactment, let the States interested do their part in upholding the hands of their universities as a separate undertaking.

We can not divorce the interest of this Association in the Newlands bill as a means to the upbuilding of engineering activities within the Land-Grant Colleges. I trust that such action may be taken by this convention as will result in placing the engineering experiment stations by the side of their elder sisters, the agricultural experiment stations, as federal-supported instrumentalities of the Land-Grant Colleges.

G. W. Bissell of Michigan. May I read for your information a resolution adopted this afternoon by the engineering division?

"*Resolved*, That it is the sense of the Engineering Division of this Association that the question of federal aid for engineering experiment stations is distinct from that of such aid for research in general. We aim to rectify an omission in previous legislation, favoring agriculture instead of both agriculture and the mechanic arts. We claim no monopoly of research or of federal aid, but we do not deem it our duty to ask such aid for any other class of institutions, or to seek a combination which would involve new questions as to an extension of federal support beyond the range of previous legislation. We do not oppose the development of research at state or private institutions, and we welcome such development wherever the best facilities and conditions can be found.

"In our judgment, however, the first obligation of the Federal Government in the support of research lies towards those colleges which have been founded and developed under the national land-grants.

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"We deprecate delaying or radically changing the scope of the Newlands bill, which we regard in substantially its present form as an immediately practicable step in the promotion of research."

My judgment coincides with that heretofore expressed, to the effect that we ought very earnestly and definitely to seek the passage of a bill which will establish engineering experiment stations at the Land-Grant Colleges. The original Act of 1862 is broad, touching both agriculture and the mechanic arts. It has been confirmed by the subsequent Acts in 1887, 1890, 1906, 1907 and 1914, superstructures erected on the foundation Morrill Act. It is unreasonable to expect us to depart from this logical procedure. I cannot help but feel that the National Association of State Universities ought to appreciate that our point of view is strictly logical and in a broad-minded way to enter into conference with us with a view of compromising our differences.

W. E. Stone. Believing that the following resolution expresses the sense of this Association I beg leave to offer it:

"*Resolved*, That it is the sense of this Association that early legislation providing for engineering research in the Land-Grant Colleges on a plan coordinate with the present status of agricultural research in these institutions, is highly desirable, and the Association hereby instructs its Executive Committee to use its best efforts to this end."

The President. This resolution is referred to the Executive Committee for future report.

W. O. Thompson. We have heard here today from persons representing the National Research Council, and that body has been brought in other ways into the debate. It will be remembered that the Council has grown out of a request of the President of the United States to 36 men of learning and science in engineering who are to maintain advisory relations. The proposal that is now before this body is that these experiment stations shall be controlled through a board composed of government officials, the Governor of the State and two persons appointed by this council. I doubt whether effective service can be secured from a board of control constituted in such a fashion, no matter how kindly disposed or how well informed it may be. We cannot afford to operate an institution that is not directly responsible to the people. Persons who represent the public to the government, who can be held directly responsible, must be in control.

One of the difficulties of this situation lies in the fact that some states have seen fit to separate special education like agricultural education from their university activities. I have no doubt of their sincerity of purpose, but, as a rule, the separatist policy has given rise to bitterness. Several types of institutions have been organized under separate management, and unfortunate debates have arisen and unhappy rivalries have been engendered. We cannot afford to inject into our great system of educational and research institutions a system whereby they will become practically controlled and governed by a separate organization out of harmony with either state or federal statutes, and simply supported by advisory relationships. The Federal Government is under no obligation, even if asked to do so, to enter a state and settle its troubles. If the Federal Government will confine its support and its activity along educational and research lines to a

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well-defined system of institutions, then it will at least be consistent with itself.

A few years ago the sum total of all the revenues of all the States was only about one-third of the sum total of the revenues of the Federal Government. The latter has steadily increased its hold on all indirect sources of revenue, while the local governments increasingly get control of the conscious sources. As a result the state revenues are limited, whereas the Federal Government can enter upon large programs. He who holds the purse eventually will control the whole situation; hence we must guard against federal encroachments.

Now we are willing to spend money, but in its spending we must be careful in adjusting relations. If we are to inaugurate a system of engineering experiment stations, and it is to be a cooperative enterprise in the sense that two governments, both erected by the people, are to distribute these funds, then we need fundamentally to know whether the relations are such that we can live with them.

I have been and am in entire sympathy with the purpose and spirit of the bill, but not at all clear that it should be pushed in preference to the great questions of preparedness, particularly as represented by the Reserve Officers' Training Corps feature of the Hay-Chamberlain bill. On the other hand many considered this engineering experiment station bill to be a preparedness measure; that much of the enthusiasm of our engineers was due to the fact that they are interested in finding out how to build a bigger and better gun than any other nation can build. We know better than that. We believe that our best national defense is the rational and normal development of the forces of this great democracy.

There lies before this country now a great opportunity to embark upon a vast national enterprise. We must not go about it in any spirit of petty debate between two institutions in some particular state. That is not the issue. The issue is a great national endeavor in which the Federal and State Governments join hands. Its administration and control may be divided in some way; but let us divide it along lines that will be rational and conformable to the dictates of sound economic theory; for the closer we do get to sound economic theory, the closer we do get to sound practice.

Before this Association adjourns, it ought to arrange that some committee meet the representatives of the National Research Council and set forth with clearness its point of view.

On motion, the Executive Committee was authorized to appoint representatives from its own membership and to designate representatives of the engineering division to attend the conference on Saturday, November 18 in New York City with representatives of the National Research Council.

K. L. Butterfield of Massachusetts. The committee on college organization and policy is not yet ready to report. Informally, with regard to some items, it reports progress.

During the coming year the secretary of the committee, Mr. Monahan of the Bureau of Education, will probably take up with college executives some rather interesting questions in regard to organization; and the committee bespeaks their cordial cooperation.

We have before us two reports made by representatives of the Bureau of Education, one by Dr. Capen on the organization of boards of trustees, and the other by Mr. Jarvis on agricultural organization and administration

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in relation to extension service. They are interesting reports, but the committee is not prepared as yet to discuss them.

Touching the subject of interchange of instructors between colleges, a matter which was presented before the Association last year by Dean Russell (Twenty-ninth Proceedings, pp. 102-104) and referred to this committee, we are not prepared to report, simply because of oversight. The chairman was not present at the last Convention, and discovered only a short time ago that that matter had been referred to this committee. It will receive due attention in the future.

THE PRESIDENT. The report of the committee on graduate study will now be presented by its chairman, H. P. Armsby of Pennsylvania.

REPORT OF THE COMMITTEE ON GRADUATE STUDY

The seventh session of the Graduate Summer School of Agriculture was held at the Massachusetts Agricultural College, July 3-28, 1916. Continuing the policy of concentration outlined at the Convention of 1913 and successfully carried out at the sixth session in 1914, the work of the school was restricted to two main lines, and was arranged upon a more systematic plan than had heretofore been undertaken. These two main lines were:

1. The fundamental factors involved in the growth of plants and animals;

2. The economic and social factors affecting profitable agriculture and rural life.

Details regarding the specific courses offered, together with a financial statement, are contained in the following report of the dean and assistant dean.

REPORT OF DEAN AND ASSISTANT DEAN

On the invitation of the committee on graduate study the undersigned accepted the offices of dean and assistant dean, respectively, for the seventh session of the Graduate School of Agriculture. The committee accepted the invitation of the president and trustees of the Massachusetts Agricultural College, Amherst, Mass., to hold this session at that institution in 1916.

The college authorities placed at the disposal of the school the large new agricultural building, known as Stockbridge Hall. The college library, laboratories, barns, experimental fields, gymnasium, athletic grounds, etc., were freely open to inspection and use. Arrangements for board and lodging of students were made in the neighborhood for from $5 to $10 a week. Members of the faculty were comfortably quartered in a hotel and one of the fraternity houses.

The total enrollment of instructors and students was 198, representing 27 states, besides the District of Columbia, Porto Rico, England, Canada and the Transvaal. A considerable number of students not registered attended one or more lectures as visitors. The biennial conclave of the Fraternity of Alpha Zeta was held during the session. Members of the regular summer school of the college attended the evening conferences.

There were 45 persons who gave instruction as lecturers or leaders of seminars and about 40 others who participated in the formal presentation of matter in the seminars and conferences. The faculty included representatives of the Universities of Illinois, Missouri, Chicago, Harvard and

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Yale, the United States Department of Agriculture, the Missouri Botanical Garden, Amherst College, The Young Men's Christian Association College at Springfield, Mass., the Massachusetts State Board of Education, the Vermont Department of Agriculture, Kalamazoo Normal School and the agricultural colleges and experiment stations in Indiana, Kansas, New Hampshire, New York, Oregon, Pennsylvania, Vermont, West Virginia and Wisconsin. A considerable number of members of the faculty of the Massachusetts Agricultural College participated in the work of the school. In particular the director and faculty of the regular graduate school of this college were active in the planning and conduct of the Association's Graduate School.

Mr. Erwin A. Forbush of the college acted as registrar and did much to promote the comfort of the instructors and students of our school. Mr. F. C. Kenney, treasurer of the college, had charge of the finances, and Mr. R. J. Watts, secretary to the president, was active in the advertising.

The international relations of the school were very happily represented by the valuable work of Dr. Benjamin Moore of the London Hospital Medical Service and Prof. C. A. Zavitz of the Ontario Agricultural College.

A preliminary announcement of the school (5,000 copies) was sent out in the number of the Massachusetts Agricultural College Bulletin for September, 1915, a prospectus issued in March was widely distributed (12,000) and a large number of copies of the final program were distributed in June, 1916. Posters were sent to agricultural and other colleges throughout the country and announcements were published in the Experiment Station Record, the Weekly News Letter of the United States Department of Agriculture and in other journals. A large amount of correspondence advertising the school was also conducted with the officers of agricultural colleges and schools, experiment stations and other institutions.

The session opened July 3, and continued four weeks. The attempt was made to develop a more systematically organized plan of work at this session than hitherto had been undertaken. This plan involved work in two main lines. One of these included progressive consideration of the fundamental factors involved in the growth of plants and animals. The other dealt with the economic and social factors which enter into the development of profitable systems of agriculture and well-organized rural communities. The fact that the Massachusetts College has been giving special attention to the problems of rural economics and sociology made it very appropriate that an effort should be made to summarize the present status of knowledge along these lines in their particular relations to American conditions. The forenoon of each day was devoted to lectures by men from different institutions and the hours were so arranged that all these lectures were open to all the members of the school. In the afternoon the school was divided into two groups, according to their interest in the problems of growth or of economics and sociology. The afternoon exercises took the form of seminars, in which the subjects of the morning lectures were further developed and discussed. Each seminar was led by an expert from outside the Massachusetts College who was given an hour in which to present his subject. He was followed by a shorter talk by a member of the faculty of the Massachusetts College or some nearby institution, and in some cases by men representing practical phases of the subject. Finally, there was questioning and discussion by members of the seminar.

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The course on growth consisted of 90 lectures and 19 seminars and continued through the four weeks of the session. This was supplemented by an adjunct course which embraced a systematic review of physico-chemical elements involved in growth and their relations to biological processes. This was given by Messrs. Anderson, Itano, Robbins, Chapman and Clark of the Massachusetts College faculty.

A week each with ten lectures and four or five seminars was given to courses in agricultural education, production, distribution and marketing, and land problems and rural organization.

Schedule of Courses[1]

Course on Growth

First week—C. E. Gordon, Ph. D., Associate Professor of Zoology and Geology, in charge. Dynamics of Growth—Lecturer: C. M. Child, Ph. D., Associate Professor of Zoology, University of Chicago. Seminar leaders: V. E. Shelford, Ph. D., Assistant Professor of Zoology, University of Illinois; F. B. Loomis, Ph. D., Professor of Comparative Anatomy, Amherst College; H. D. Goodale, Ph. D., Research Biologist; O. L. Clark, B. S., Assistant Botanist.

Second week—J. S. Chamberlain, Ph. D., Professor of Organic and Agricultural Chemistry, in charge. Elemental Chemical Synthesis of Growth—Lecturer: Benj. Moore, D. Sc., London Hospital Medical College. Seminar leaders: E .V. McCollum, Ph. D., Professor of Agricultural Chemistry, University of Wisconsin; J. B. Lindsey, Ph. D., Goessmann Professor of Chemistry; C. A. Peters, Ph. D., Professor of Inorganic and Soil Chemistry; A. J. Hopkins, Ph. D., Professor of Chemistry, Amherst College; F. W. Morse, M. S., Research Chemist; J. S. Chamberlain.

Third week—G. H. Chapman, Ph. D., Assistant Botanist, in charge. Cell Entity or Growth Organization—Lecturer: B. M. Duggar, Ph. D., Missouri Botanical Garden. Seminar leaders: L. J. Henderson, M. D., Assistant Professor of Biological Chemistry, Harvard University; G. H. Chapman; W. Shumway, Ph. D., Biological Department, Amherst College; A. Itano, Ph. D., Department of Microbiology; J. B. Zinn, Ph. D., Chemical Department, Amherst College; A. S. Goodale, B. A., Associate Professor of Botany, Amherst College; O. L. Clark; A. V. Osmun, M. S., Professor of Botany.

Fourth week—A. V. Osmun, in charge. Growth Relations—Lecturer: H. C. Cowles, Ph. D., Professor of Plant Ecology, University of Chicago. Seminar leaders: L. J. Henderson; O. L. Clark; J. K. Shaw, Ph. D., Research Pomologist; C. H. Thompson, M. S., Assistant Professor of Horticulture; A. K. Harrison, Assistant Professor of Landscape Gardening; H. T. Fernald, Ph. D., Professor of Entomology.

Courses on Rural Economics and Sociology

First week—W. R. Hart, A. M., Professor of Agricultural Education, and R. W. Stimson, A. M., Massachusetts State Board of Education, in charge. Agricultural Education—Lecturers: W. C. Bagley, Ph. D., Director of The School of Education, University of Illinois; W. W. Charters, Ph. D.,

[1] The name of the college is omitted after the names of persons in the faculty of the Massachusetts Agricultural College.

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Professor of Theory of Teaching, University of Missouri. Seminar leaders: R. L. Watts, M. S., Dean of the School of Agriculture, Pennsylvania State College; C. G. Woodbury, M. S., Professor of Horticulture, Purdue University; C. A. Zavitz, D. Sc., Professor and Director of Experiments in Field Husbandry, Ontario Agricultural College; J. E. Rice, B. S. A., Professor of Poultry Husbandry, Cornell University; A. S. Thomson, A. M., Assistant Professor of Market Gardening; W. W. Chenoweth, M. Sc., Associate Professor of Pomology; S. B. Haskell, B. Sc., Professor of Agronomy; J. C. Graham, B. Sc., Professor of Poultry Husbandry.

Second week—J. A. Foord, M. S. A., Head of Division of Agriculture and Professor of Farm Administration, and F. A. Waugh, M. S., Head of Division of Horticulture and Professor of Landscape Gardening, in charge. Production and Business Methods—Lecturers: E. H. Thomson, M. S. A., Office of Farm Management, U. S. Department of Agriculture, and J. A. Bexell, A. M., Dean of the School of Commerce, Oregon Agricultural College. Seminar leaders: M. B. Cummings, Ph. D., Professor of Horticulture, University of Vermont; L. C. Corbett, M. Sc., Agriculturist, Bureau of Plant Industry, U. S. Department of Agriculture; E. A. White, B. S., Professor of Floriculture, Cornell University; F. Rasmussen, B. S. A., Professor of Dairying, New Hampshire Agricultural College; J. E. Rice, Cornell University; F. C. Sears, M. S., Professor of Pomology; H. F. Tompson, B. S., Professor of Market Gardening; A. H. Nehrling, Associate Professor of Floriculture; J. C. McNutt, B. S., Professor of Animal Husbandry; J. C. Graham.

Third week—A. E. Cance, Ph. D., Professor of Agricultural Economics, and E. F. Damon, B. S., Extension Associate Professor of Agricultural Economics, in charge. Distribution and Marketing—Lecturers: L. D. H. Weld, Ph. D., Professor of Business Administration, Sheffield Scientific School, Yale University, and C. J. Brand, B. A., Chief of Office of Markets and Rural Organization, U. S. Department of Agriculture. Seminar leaders: R. W. Rees, B. S., Extension Instructor of Pomology; H. C. Thompson, B. S., Horticulturist, Bureau of Plant Industry, U. S. Department of Agriculture; E. A. White; F. Rasmussen; E. W. Benjamin, Ph. D., Assistant Professor of Poultry Husbandry, Cornell University; V. K. McElheny, A. M., President of the American Food and Produce Auction Association, New York City; C. R. White, Ionia, N. Y.; W. J. Thurston, Cooperative Flower Exchange, Boston, Mass.; E. S. Brigham, M. S., Commissioner of Agriculture, Vermont; F. G. Urner, New York City; H. J. Bird, Produce Department of Swift & Company; E. F. Damon; H. F. Tompson; A. H. Nehrling; W. P. B. Lockwood, M. S., Professor of Dairying; A. G. Lunn, B. S., Extension Instructor in Poultry Husbandry.

Fourth week—John Phelan, A. M., Professor of Rural Sociology, in charge. Rural Organization and Land Problems—Lecturers: K. L. Butterfield, LL. D., President Massachusetts Agricultural College; Ernest Burnham, Ph. D., Director Rural School Department, Kalamazoo Normal School, Kalamazoo, Michigan; H. C. Taylor, Ph. D., Professor of Agricultural Economics, University of Wisconsin. Seminar leaders: C. W. Thompson, A. M., Specialist in Rural Organization, Office of Markets and Rural Organization, U. S. Department of Agriculture; John Phelan; L. H. Bailey, LL. D., Ithaca, N. Y.; W. J. Campbell, M. A., Director of Country Work Course, Y. M. C. A. College, Springfield, Mass.; J. W. Crook, Ph. D., Professor of Economics, Amherst College; J. D. Willard, A. B., General Secre-

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tary, Franklin County Farm Bureau, Mass.; W. H. Hamilton, Ph. D., Professor of Economics, Amherst College; E. L. Morgan, A. M., Extension Professor of Community Planning; S. R. Parker, B. S., Extension Professor of Rural Organization; W. D. Hurd, M. Agr., Director of Extension Service; R. J. Sprague, Ph. D., Professor of Economics and Sociology.

Public exercises were held on the evening of July 5. H. P. Armsby, Ph. D., Director of the Institute of Nutrition, Pennsylvania State College, presided as chairman of the committee on graduate study, and spoke on "The Place of Graduate Study in Agricultural Education."

President Butterfield welcomed the school to the Massachusetts Agricultural College. Rev. J. H. Hoyt represented the Granges of New England, and spoke on "Human Improvement in Agriculture," and Dean True spoke on "The Policies and Work in the Graduate School."

Six conferences on matters of general interest to students of agricultural education and research were held on evenings and Saturdays. The subjects and leaders of these conferences were as follows:

Training Men for Agricultural Service—H. J. Waters, LL. D., President of Kansas State Agricultural College; G. A. Works, M. S., Professor of Rural Education, Cornell University.

The Scientific Basis of Agriculture (two conferences)—W. H. Jordan, D. Sc., Director of the New York State Experiment Station.

Farm Finance. J. L. Coulter, Ph. D., Dean of the College of Agriculture, West Virginia University.

Making the Farm Pay. G. F. Warren, Ph. D., Professor of Farm Management, Cornell University.

Massachusetts Achievement in Rural Organization. E. L. Morgan, A. M., Massachusetts Agricultural College.

A reception to the faculty and students of the Graduate School was given by President and Mrs. Butterfield at their home, and the members of the Graduate School and the Summer School conducted a joint social event. There were excursions to the old village of Deerfield, to Mount Holyoke and Smith Colleges, to a large paper mill at Holyoke, Mass., to Mounts Tom and Holyoke, and to other points of agricultural and historical interest in the vicinity of Amherst.

RECEIPTS AND EXPENDITURES ON ACCOUNT OF GRADUATE SCHOOL OF AGRICULTURE, 1916

RECEIPTS

Association of American Agricultural Colleges and Experiment Stations	$2,000 00
Massachusetts Agricultural College	2,000 00
Matriculation fees	660 00
	$4,660 00

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EXPENDITURES

Services of dean and honorariums to lecturers	$1,510 00
Travel, board and lodging of lecturers	2,465 03
Printing	324 14
Postage and stationery	204 59
Telephone, telegraph and express	4 90
Labor	90 88
Balance unexpended	60 46
	$4,660 00

At this session the Graduate School presented a well-rounded course, starting with the question of the origin of living from non-living matter and dealing in order with the chemistry, physics, and biology of the soil; the growth relations of plants and animals; the economic factors of production, distribution, and marketing of farm products; and, finally, with the potentialities and possibilities of life in the open country. The fundamental principles of common interest to all students of scientific agriculture were emphasized rather than economic applications in specialized lines of industry, no attempt being made to deal with any special line in a complete way. The course was especially suggestive to investigators and should have been helpful to those entering upon the work of investigation. Emphasis was constantly placed, directly or by inference, upon the importance of dealing with agricultural problems at first hand and of having accurate, live, first-hand information for this purpose.

The work on rural economics and sociology showed how great has been the advance in recent years in the collection and consideration of definite data on marketing and other economic problems in agriculture in the United States, as well as the rapid progress in the establishment of state and federal agencies for the study of these problems and the giving of assistance in their practical solution.

In respect to the amount and high character of the work done, this session of the Graduate School was fully as important and successful as any which have preceded it. The local arrangements were very good, and the courses of instruction were loyally supported and largely attended by the relatively large force now employed by the Massachusetts College. The attendance from outside, however, while representing all sections of the United States, was disappointingly small in the aggregate.

It is evident that the causes which have operated to depress the attendance at other sessions have increased in influence and were not overcome by unusually active measures to advertise the school this year. Among these hindrances, the most potent seem to be the great increase of summer work and other burdens on members of the college faculties, the opening up of greater opportunities for regular graduate work in agriculture at numerous institutions, and the inability of the Association's Graduate School, under present conditions, to give credit for the work done there which might be used elsewhere as part of the requirements for advanced degrees.

The suggestion has been made that at the next session of the school an arrangement be made with some institution giving graduate courses by which the work in the Association's Graduate School would fit into and

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supplement the course at the holding institution in such a way as to make it available for credit toward advanced degrees.

The future status of this Graduate School, therefore, needs very careful consideration by the Association and its constituent institutions.

A. C. True, *Dean.*
Charles E. Marshall, *Assistant Dean.*

More than usual effort was made to bring the School to the attention of both the executive officers of the agricultural colleges and experiment stations and the individual members of their staffs.

Under date of Nov. 1, 1915, a circular letter was sent by the chairman of the committee to the executive of each agricultural college and experiment station, calling attention to the following resolutions adopted by the Association in 1915 (Twenty-Ninth Proceedings, p. 151):

Resolved, That it is the sense of this Association that the best interests of the inflividual institutions would be advanced and the efficiency of the work of the Association as a whole furthered greatly by the adoption of a definite policy whereby at least a certain fraction of the workers in each institution should be enabled to attend each session of the Graduate Summer School of Agriculture.

Resolved, That the Association recommends to the several institutions that time spent in attendance at the Graduate Summer School of Agriculture be not deducted from the vacation leave of members of the staff but be treated as an absence with pay on the business of the institution.

Replies to this letter were received from 27 institutions. Their general tenor indicated on the part of the executives an appreciation of the work of the Graduate Summer School and a desire that members of their staffs should take advantage of it, although in a number of instances they not unnaturally felt obliged to qualify this desire by such phrases as "Whenever possible," "Those who can be spared from the work," "So far as our conditions will permit," and the like.

None of the replies made any definite response to the first resolution. As regards the second, 13 were definitely favorable, six more were indefinitely favorable, and eight were simply acknowledgments. Specific affirmative action upon this point was reported from 11 institutions, viz.: California, Florida, Georgia, Iowa, Minnesota, Nebraska, New Hampshire, New York (Geneva), Ohio (Station), Utah and Vermont. The committee would be glad to learn of any other institution whose name should be included in this list. The executive of one institution expressed its willingness not only to give members of its staff leave of absence with pay for attendance at the Graduate School but also to meet half of their expenses.

In addition to the circular letter just mentioned, the program of the seventh session was, as appears from the dean's report, very thoroughly advertised; but the results as regards attendance were somewhat disappointing. The total registration of students was 153, but this includes a considerable number from the Massachusetts Agricultural College. There is always difficulty in classifying the attendance upon the Graduate School. The number paying matriculation fees was 66, which may probably be taken as approximately representing the attendance from outside the holding institution. It is of some interest to compare this with the attendance on previous sessions. Not including the women attending the sessions of the

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Graduate School of Home Economics in 1908 and 1912, the total enrollment and the number of students paying matriculation fees were as follows:

	Location	Total enrollment	Number paying matriculation fees
1902	Ohio	75	75
1906	Illinois	91	71
1908	Iowa	125	122
1910	New York	207	126
1912	Michigan	139	89
1914	Missouri	150	83
1916	Massachusetts	153(?)	66

It thus appears that the high water mark of attendance from outside the holding institution was reached in the years 1908 and 1910, and that there has been a distinct decline since that time. Various causes, including perhaps to some extent geographical considerations, have without doubt, contributed to this falling off. It seems likely that one potent factor has been the increasing amount of summer work required at the various institutions, including, it may be presumed, the demands of the rapidly expanding extension work.

There appears to be also a growing desire on the part of students for some form of academic credit for work done at the Graduate Summer School, which it is impossible to give under present conditions.

Finally, due consideration should be given to the increasing opportunities for graduate work in agriculture offered at many institutions. Data collected by the States Relations Service show that, of the 48 land-grant institutions, 25 had six or more graduate students in agriculture enrolled during the academic year 1915-16. The largest number reported was 238 and the second and third largest respectively were 99 and 65, the total for all the institutions being 938. Moreover, the six colleges which alone had data on this point reported a total of 30 of their alumni pursuing graduate study at non-agricultural institutions in preparation for agricultural work. It is obvious that systematic graduate work occupies a much larger place in our scheme of agricultural education than it did 15 years ago and that the situation has materially changed since the inauguration of the Graduate Summer School.

These facts, while gratifying, suggest the query whether the Graduate Summer School in its present form may not have accomplished to a large extent the principal object for which it was founded and raise the question what shall be the future policy of the Association as regards the promotion of graduate study in agriculture.

Your committee has considered this important question at some length, but in the limited time at its disposal it has not been able to reach any final conclusions and is not prepared to make any specific recommendations at this time. In lieu, thereof, without seeking to forestall discussion at the present time should this Convention desire it, it recommends that the session of the Graduate Summer School, which would in the ordinary course be held in 1918 be postponed for one year, and that the Executive Committee be instructed to provide in the program of the next Convention for the consideration of this question with the understanding that your

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committee will at that time submit definite recommendations for consideration by the Association.

W. O. THOMPSON,
BROWN AYRES,
F. B. MUMFORD,
H. P. ARMSBY, *Chairman.*

On motion, the report of the committee on graduate study was received.

THE PRESIDENT. The report of the committee on instruction in agriculture will now be presented by its chairman, A. C. True of Washington, D. C.

A. C. TRUE of Washington, D. C. The committee on instruction in agriculture decided to consider the topic of instruction in high school agriculture in its relation to agriculture as taught in the land-grant colleges. The committee has followed the same plan as it has carried out for a number of years, and with the aid of the States Relations Service made a special study of this matter through the country. This study has been made directly by Mr. D. J. Crosby, who acted as the secretary of the committee, and has summarized the results of study for committee use. The report incorporates the results of this study, together with certain conclusions reached by the committee.

REPORT OF COMMITTEE ON INSTRUCTION IN AGRICULTURE[1]

RELATIONS OF HIGH SCHOOL AGRICULTURE TO AGRICULTURE AS TAUGHT IN THE LAND-GRANT COLLEGES

What entrance credit should the Agricultural Colleges give for high school agriculture? Should the agricultural colleges hold out credit inducements for high school agriculture other than for entrance credit, and if so, to what extent? What phases of agriculture, if any, may eventually be well enough taught in public high schools to deserve college credit other than entrance credit? Under what conditions might agriculture be so taught in high schools as to deserve college credit? If high school agriculture is not likely to be given college credit, what influence may it be expected to have upon college agriculture, particularly as to raising the grade of instruction or eliminating some of the more general or elementary courses?

These questions and others of similar import have been arising almost incessantly during the past four or five years. This fact, and the rapidly growing extent and importance of high school instruction in agriculture, has led the committee this year to undertake a study of the relations of high school agriculture to agriculture as taught in the Land-Grant Colleges.

In making this study some dependence was placed upon college catalogs, annual reports, and other printed matter, but in the main data were secured by correspondence. Letters were sent to all state departments of education and replies were received from all but three, either directly from the state superintendents or indirectly from deputies, high school inspectors, or supervisors of agricultural education. In like manner, data and expressions of opinion were secured from every state agricultural college, either from presidents, deans, or professors of agricultural edu-

[1] Nineteenth report.

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cation. Statistics of high school agriculture were gathered by a member of the committee, through the agency of the United States Bureau of Education, from 2,200 of the 4,660 high schools in which agriculture is taught and from 85 special schools of agriculture. In these various ways considerable information was obtained, and while it is by no means complete, nevertheless it has come from a sufficient number of reliable sources to give the basis for unbiased and rather significant conclusions. Except as indicated above, the work of collecting and summarizing the data was done by Mr. D. J. Crosby, as secretary of the committee.

COLLEGE ENTRANCE CREDITS FOR HIGH SCHOOL AGRICULTURE

Agriculture is now credited for college entrance almost as generally as any other subject taught in high schools. In 35 of the agricultural college catalogs there are definite statements to the effect that agriculture will be accepted for entrance credit, the amount accepted varying from ½ unit to 4 units. In nine other colleges it is presumably accepted under regulations permitting candidates to offer any high school subject affording training equivalent to that of certain enumerated subjects. So that about 44 of the 48 state colleges of agriculture now accept agriculture for entrance.

This is an indication of very good progress in the development of satisfactory relations between the Agricultural Colleges and the public high schools. More rapid progress could hardly have been expected. Since 80 percent of the 2,200 high schools reporting courses in agriculture have introduced those courses within the last five years and over 97 percent of them have introduced agriculture within ten years, it is certain that not many of the Agricultural Colleges could have had opportunity to give credit to high school agriculture more than five or six years ago. It would seem, therefore, that most of the Agricultural Colleges are meeting the high schools fully half way and are giving entrance credit for high school agriculture as soon as the subject is sufficiently well taught to make it possible for them so to recognize the subject.

Nor are the Agricultural Colleges alone in giving entrance credit for high school agriculture. Many of the other colleges in state universities and not a few of the privately endowed colleges now place high school agriculture in the same category with elementary science and other subjects which are usually treated as electives in high school courses.

Neither is it to be assumed that because the Agricultural Colleges so generally accept agriculture for entrance credits they are lowering their standards. On the contrary, the standards for admission to the Agricultural Colleges have advanced as rapidly as local conditions and the high school standards in the several States would permit. It is not so very many years ago that many of the Colleges of Agriculture were doing more or less high school work without clearly differentiating it from college work, but with the exception of some general or elementary courses in agriculture still retained in freshman year, this condition no longer prevails in many of the institutions. Secondary work is done, it is true, by some 32 of the agricultural colleges, but in most cases this work is now clearly differentiated from work for which college credits are given.

A few years ago the entrance requirements of the agricultural colleges were in many cases low and not clearly defined as regards high school relationships, but this condition is rapidly passing away. At the present

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time 29 of the agricultural colleges, or more than half of them, require 15 or more high school units for college entrance, 42 of them require 14 or more units, four of the remaining six require 13, 12, 10 and 8 units, respectively, and two will accept students showing a certificate of graduation from any four-year high school course. Those colleges whose entrance requirements are below 14 units are gradually raising their requirements, so that it may be expected that within another decade all of the colleges of agriculture will be up to or above the 14-unit standard.

ADVANCED CREDIT FOR HIGH SCHOOL AGRICULTURE

The proposition has been advanced that since the introductory courses and the more general courses in agriculture, as taught in quite a number of the agricultural colleges, are rather elementary in their nature, the time might come in the near future when much of this work could be done in high schools and students coming from such schools with agricultural credits could be excused from similar courses in the college, or might even be given college credit for such work. As yet, however, it does not appear that such credit is being given except in very unusual cases. Replies to inquiries sent out by the committee indicate that in 41 of the colleges of agriculture no such credit is given. One college permits examinations to be taken in special cases; one credits some class work, but not the laboratory work in corresponding courses; and three excuse students from elementary college courses in agriculture in special cases, each of which is considered on its own merits. One college having very close organic relations with the high schools of the State and having its own graduates in nearly all of these schools as teachers, excuses students from any course in agriculture for which corresponding work is given in high schools. In none of these cases, however, does an excuse from a college course in agriculture give the student credits toward graduation. It simply allows him to take other subjects for credit. So far as the committee is able to learn there is only one agricultural college which actually gives college credit for high school work in agriculture, and this is done only in special cases.

Numerous reasons are given for not crediting high school agriculture toward college graduation. It is said that as yet the subject is not generally well enough taught in high schools; that the work is not standardized; that often it is not even secondary but very elementary in nature. Another objection is that the teachers are not sufficiently well trained to permit the colleges to accept the grades they give to students. This is a very strong argument when consideration is given to the fact that 57 percent of the teachers of agriculture in the schools reporting to the committee have had no special training whatever for agricultural work. Less than 15 percent of them have had a four-year course in an agricultural college. The qualifications for teachers of agriculture in high schools, so far as they have been prescribed, are given on pages 16 and 17.

The very recent development of agriculture as a high school subject is a further reason for assuming that it is not yet well enough taught to be given college credit. As yet there is a relatively small number of entering students who present agriculture for entrance credits, and presumably a still smaller number who have any surplus to present for advanced credits. It is not strange, therefore, in view of the fact that scarcely more

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than 40 percent of all the high schools of the United States are reported as teaching agriculture, that many schools offer not more than one or two semesters of agriculture, and that less than thirteen percent of those reporting to the committee (2.5 percent of all high schools) were teaching agriculture five years ago—it is not strange under these conditions that the agricultural colleges have not given serious consideration to crediting this subject for graduation or to eliminating the more elementary phases of their own courses in agriculture.

Surely there is and should be a pretty clear distinction between high school agriculture in its present nebulous condition as to subject matter and methods of instruction, and such other high school subjects as English and modern languages, which have been taught so long as to become fairly well organized and standardized, and this distinction should be kept in mind when considering the giving of credits for high school agriculture.

INFLUENCE OF HIGH SCHOOL AGRICULTURE ON COLLEGE AGRICULTURE

As to the influence of high school agriculture upon college courses in agriculture, it is too early in the development of the movement to make estimates of any particular value.

Replies from 39 of the colleges of agriculture indicate that as yet there is no recognized influence upon the college courses. A few correspondents called attention to the fact that the grade of college instruction in agriculture is gradually being raised, but only one man clearly attributes this change to the influence of high school agriculture. Not one of the agricultural colleges has as yet made freshman class sections on the basis of previous instruction in agriculture for a part of the students, and apparently only ten colleges have made any inquiry as to previous training in agriculture of entering students.

There are difficulties in the way of giving special recognition to students entering with high school credits in agriculture, especially as regards separate class sections for them. In the first place, not all of the agricultural colleges offer general courses in agriculture from which a part of the freshmen, those from high school courses in agriculture, could be excused, if such a procedure were desirable, and in the second place, there are very few high schools which could ever be expected to teach agriculture so thoroughly as to warrant colleges in excusing their graduates from courses in special phases of agriculture, such as animal husbandry, farm crops, or pomology.

Nevertheless, at the present rate of increase in the number of high schools teaching agriculture and in the number of high school graduates who will come to the colleges of agriculture with considerable training in agriculture of as high a grade as many of the colleges gave 25 or 30 years ago, it will not be long before a profound influence will be exerted upon the college courses in agriculture, and the college men will be subjected to strong pressure to offer some sort of solution for the problem of overlapping college and high school work in agriculture. One college president gives strong emphasis to the statement that "nothing is more deadening to the spirit of the freshman in college than to find that he must take some subject in college that he has covered essentially in the high school." He goes on to say that "a gap between the high school and the college is less disastrous than overlapping," and that "the colleges should be careful to keep their standards high enough to be out of the way of the high schools." It

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has been suggested that the solution of the problem will probably be along one of two lines—(1) some form of college credit for high school agriculture, or (2) the elimination from the college curricula of general or elementary courses in agriculture carrying college credit. As the following discussion will show, the first alternative is hardly a tenable one.

(1) COLLEGE CREDIT FOR HIGH SCHOOL AGRICULTURE

It is doubtful in the minds of nearly all of those who have been consulted by the committee whether high school agriculture will ever receive direct college credit, whether it would be wise thus to encourage high schools to undertake college work. It is believed that there are already too many attempts in that direction, too many college graduates have tried to teach senior college subjects to first-year high school pupils. At the same time there are many college men who believe that most of what is now included in freshman agriculture will eventually be taught in high schools. As one dean of a college of agriculture writes—

"At least certain courses in agronomy and animal husbandry, including dairy husbandry, will be taught by the secondary schools in such ways that if college credit cannot be given, they will not at least be repeated in the college courses."

He also believes that shortly the same remark can be extended to certain work in farm mechanics and in horticulture, particularly vegetable gardening. In much the same vein another dean writes that—

"Most of the manual work in agriculture, such as plant propagation, transplanting, pruning, spraying, etc., can be taught as well in high schools as in colleges."

This point of view would seem to indicate a desire to relegate to the high schools many of the features of laboratory work and of farm practice discussed in the sixteenth and seventeenth reports of this committee.[1] It is likely that much of this manual work in agriculture might be given by the high schools, particularly those that emphasize the home project method of teaching farm practice.

In Idaho they find that high school students who have had a good deal of experience in such work as milk and cream testing and butter making in high school, the high school work is as efficient as that in the college, and they permit them to take other college work and apply this high school work as entrance credit.

One of the college presidents says—

"The colleges will simply take up in agriculture, as they do in English and mathematics, the subject where the high schools leave off."

Those from whom quotations have been given agree that much of the freshman agriculture is of such a character as might be satisfactorily taught in a properly equipped high school. Duplication would be avoided by permitting students coming from high schools where agriculture is taught satisfactorily to substitute more advanced courses in the freshman year.

On the other hand there are those who do not think that there is much duplication. One dean takes the position that—

"The agricultural courses in high schools are general courses. Where general courses in agriculture are offered in a college, it is possible that

[1] Proceedings, 1913 and 1914.

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secondary instruction might take the place of some of these general courses."

In another college where nearly all of the agricultural work is specialized, the faculty have considered the desirability of "requiring those entering without high school agriculture to take in freshman college year a general course in agriculture to include the equivalent of high school agriculture."

Others believe that, as in mathematics where pupils come around again and again to the fundamental operations of addition, subtraction, multiplication, and division, no great harm would come from a little repetition. As one correspondent put it, "stock-judging in high schools is usually carried on with a few breeds and often with inferior animals," and under such circumstances might well be repeated in college, and again, in the opinion of another—

"Soils taken by high school pupils at the age of fifteen might well be repeated by them after they have had thorough preparation in chemistry and geology in college at the age of twenty."

The quotations just given are fairly representative of the attitude of college men toward high school agriculture. It is in no way antagonistic, quite the contrary. It is the attitude of men who must have something more tangible to deal with than a subject which is taught in only 40 percent of all the schools that are supplying the colleges with students, by teachers less than half of whom have had any specific training in agriculture.

In Kansas, where 48 percent of entering freshmen present entrance credits in agriculture, in Utah where "practically every high school in the State now offers from one to four years of work in agriculture, the teachers of which are with few exceptions graduates of agricultural colleges and most of them of the Utah Agricultural College, and in a few other states where somewhat similar conditions prevail, the relationships between high school and college agriculture are now under serious consideration and some sort of adjustment will come soon. In fact, Utah has already made a fairly satisfactory adjustment, judging from the following excerpts from a letter from former Director Ball of the Agricultural College of Utah—

"Such courses as breeds of livestock, general horticulture, elementary agriculture and the like are now given so well in these high schools that we do not require students to repeat these courses. A student that has taken stock-judging in the high school and expects to specialize in animal husbandry is advised to take the work in stock-judging over at the College, while the student who expects to specialize in agronomy, horticulture and the like does not take the college work in stock-judging, this subject, of course, being a rather difficult one to teach in the average high school on account of the meagre material available. Most of the other courses, however, are given with the same text-books as our elementary courses and students entering who have had these courses go on to more advanced work. So far, therefore, we have settled the problem not by modification of existing courses but by accepting high school work as equivalent to our elementary courses, except in the case where a student is expecting to major in a subject. In these cases, special arrangements are often made.

"The commoner courses offered in our high schools which are not repeated in college are, therefore, as follows: breed types, general fruit growing, vegetable gardening, bush fruits, soils (second course) and crops

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(second course) and sometimes entomology and rarely agricultural chemistry, only one or two of our high schools giving this course.

"This does not mean that the student receives college credit for high school work any more than if a student had had two years of German in high school and it was submitted as part of the electives for entrance requirements, would receive college credit for the German. But in college they would take third year work in German and not first year work."

But this fairly satisfactory situation in Utah is hardly typical of the conditions throughout the country. Utah has but 41 high schools, only six states have fewer, while 32 have each more than three times as many. With only 41 high schools and most of these in highly intensified irrigated sections, the problems of securing trained teachers and satisfactory supervision are comparatively simple. In most of the States there will need to be a much larger percentage than at present of trained teachers and of fairly well standardized high school courses in agriculture before any sort of adjustment as to college credit is feasible.

(2) THE ELIMINATION OF GENERAL OR ELEMENTARY COURSES IN AGRICULTURE CARRYING COLLEGE CREDIT

As to the elimination of existing general agricultural courses in college freshman year, there is not much to be said at present because many of the colleges do not offer such courses, and, further, because the same factors as to numbers of high school courses and teachers and of entering freshmen with units in agriculture enter into the problem. But with these factors eliminated, with 40 or 50 percent of entering freshmen presenting satisfactory high school units in agriculture, which is by no means a remote possibility, it would seem as though some adjustment of relationships might be made by means of beginning courses in agriculture for freshmen, from which those having such high school credits could be excused in order to take more advanced courses, but which those deficient in such credits would be required to take.

Such an adjustment of courses would seem in most cases to be satisfactory to all concerned. It would enable high school boys who intend to become farmers to take all of the available high school courses in agriculture without detriment to themselves if later they find it possible to pursue an agricultural course in college. The time gained by being excused from freshman agriculture would be available to make up language or other scholastic requirements which otherwise would have been taken in high school. It would bring about a better condition in college classes in agriculture by relegating to these beginning courses all students who enter without high school credits in agriculture. And finally, it would no longer subject the colleges to criticism for giving counts toward graduation for what is manifestly secondary school work and would enable them to raise the grade of college courses in agriculture all along the line.

CONDITIONS NECESSARY TO A CHANGED ATTITUDE TOWARD HIGH SCHOOL AGRICULTURE

The problem of bringing about a better correlation of college and high school work in agriculture has other important factors than mere numbers of schools or of students coming from them. Numbers of students there must be, of course, before the colleges will feel called upon to consider

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the character of their instruction as to subject matter and thoroughness, but even if all the entering students were to present high school agriculture for credit, the colleges would not be justified in giving credit until they had examined the credentials. Some of the things they would want to look into are—

1. Training of teachers of agriculture.—Not only should there be more teachers with some training in agriculture, but they should be better trained than most of them now are. This is a function and a duty of the agricultural colleges. All of them have funds which can be used in that way. There is no other set of institutions or agencies that can satisfactorily train teachers of agriculture for positions in colleges and high schools. The teacher-training contract will be a big one for the agricultural colleges. Twelve hundred trained teachers are needed for high schools now, and almost as many will be needed annually hereafter. The tenure of high school teachers of agriculture will be short because such teachers are in great demand for farm bureau positions, as well as for positions in college teaching and extension teaching.

One of the largest and most important tasks of the agricultural colleges in this adjustment of agricultural relations with high schools is to turn out a corps of well equipped young men who will teach agriculture—secondary agriculture—in a sensible and satisfactory manner.

And it is a duty of scarcely less importance for the agricultural colleges to look to the quality of teaching in their own classrooms. In too many cases a young man with no other professional qualification than his bachelor's degree, with no experience in teaching and with no professional training for it, is employed to teach freshmen. It not infrequently happens that he does not even have the rank of instructor but is an assistant or a fellow, dividing his time between teaching and graduate study. Under such conditions it is conceivable that many a freshman might come from a high school where the fundamentals of elementary agriculture are better taught than in the state college which he enters. Such a state of affairs would be even more depressing and disastrous than overlapping courses.

2. Course of study.—The high school course of study should articulate with that of the agricultural college before satisfactory credit relations can be established. It is not a function of the agricultural college to make high school curricula. This duty devolves upon the state and local school authorities. But the agricultural college should be consulted regarding the work to be done in agriculture and should take part in outlining this work. This does not mean that the agricultural college should set arbitrary standards for the high schools. It should not dominate the situation in any such way. It is not the chief business of the high school to prepare students for college, that is only one of its functions. Hence the high school should not be expected to conform to arbitrary rules laid down by any college or set of colleges. The adjustment of relations between agricultural colleges and high schools should be brought about by conferences between college and high school authorities, in which the interest of both sides should be considered and guarded. The important thing is that the two should get together. There should be as little overlapping of work as possible and there should be no gaps between the two grades of work.

3. Text-books, manuals, and equipment.—Many good text-books and manuals are now available for high school agriculture, but it frequently

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happens that inexperienced teachers or school officers select books ill adapted to the school or to the agriculture of the region. The same is often true of apparatus, charts, maps and other facilities for teaching. The agricultural colleges could be of great assistance to the schools in this matter of selecting suitable books and other teaching aids, and also in the actual preparation of subject matter where the available texts do not fit local conditions. Some of the colleges have engaged systematically in the task of preparing subject matter in the form of bulletins or as text-books, apparently with gratifying success. It may or may not be significant that one of these colleges (Kansas) is the institution mentioned as having high school entrance credits offered by 48 percent of its last freshman class.

4. Supervision of high school agriculture.—Not much can be done toward systematizing the instruction or raising the grade of high school agriculture until it has thorough supervision, nor can the colleges of agriculture go far toward giving it official recognition until they have some part in the supervision.

At the present time in 28 states there is practically no supervision of the subject, aside from a somewhat perfunctory general high school inspection, or, as in six states, a purely local supervision. In six states supervision is by the colleges of agriculture, in six by agricultural specialists attached to the state departments of education, and in eight jointly by the colleges and the state departments.

Where supervision is under regular high school inspectors it is not often satisfactory even to the department of education. Several of the state superintendents of public instruction say that vocational inspectors or specialists in agriculture should be provided to supervise agricultural courses.

Where there is supervision by agricultural specialists or where supervision is jointly arranged for by the state departments of education and the colleges of agriculture, it is quite generally reported as satisfactory. One of the most satisfactory arrangements is where the supervisor is an officer of the state department but is an agricultural specialist and has his office at the college of agriculture.

Supervision of such a subject as agriculture, with its many local variations and applications, should be more suggestive and advisory than arbitrary, hence the importance of having supervisors who are broadly trained in agriculture, who, for example, can appreciate the importance of emphasizing dairying in one section and horticulture in another, and who can suggest ways of mapping out courses which will permit of such local emphasis without seriously disturbing the balance of the whole course.

But there should be enough of real authority to meet the exigencies arising in local school organization and for this reason the supervisors should be officers of the state departments, where authority rests. On the other hand, these supervisors should be in hearty sympathy with agriculture and should keep up with the progress in agricultural practice and education. This means that they should be closely connected with the colleges of agriculture.

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SUMMARY

Agriculture is now reported from 4,660 high schools in the United States. The committee has received reports directly from 2,200 of these schools.

These 2,200 schools constitute only about 19 percent of all high schools, but the fact that 97 percent of these schools have introduced agriculture within ten years indicates that the number is likely to increase rapidly in the future.

With the increase in high school courses in agriculture and in the number of graduates from them, come increasing demands upon the colleges of agriculture for entrance credit and college credit in this subject.

At the present time nearly 92 percent of the colleges of agriculture give entrance credits for high school agriculture. These credits range from ½ unit to 4 units.

Only one college of agriculture actually allows credits toward graduation for high school agriculture, and that only by special arrangement. Forty-one of the colleges make no provision of any sort for such advanced credits. The remaining six make some concessions in the way of excusing students from secondary courses in agriculture or permitting them to take examinations.

No college has as yet made class sections to separate those who have had high school agriculture from those who have not.

Many of the college men recognize the fact that the excellent grade of work in agriculture done by a few of the high schools demonstrates the possibility and probability that soon many of the high schools will be in a position to teach satisfactorily much of what is now included in college freshman agriculture.

When such a condition is reached in a large percentage of the high schools in any state, arrangements should be made so to adjust the college and high school relationships as to give candidates for college entrance full credit for all agricultural work satisfactorily done in high school. This may be done by excusing from freshman agriculture students who have covered this work satisfactorily in high school, thus permitting them to take more advanced work.

The apparent reasons why such an adjustment has not already been made are: (1) the relatively small percentage of high schools teaching agriculture, (2) the lack of trained teachers of agriculture, and (3) the lack of supervision of such a character as would result in a satisfactory standardization of courses, methods, text-books and equipment.

The first of these difficulties is rapidly being removed, the other two can only be removed through the active and cordial cooperation of the agricultural colleges. The apparent functions of the colleges in this connection are:

1. To graduate annually from 1,000 to 1,200 young men with satisfactory training, and an inclination, for teaching agriculture in high schools.

2. To assist in developing suitable courses in agriculture for high schools.

3. To assist in selecting and preparing agricultural text-books, manuals and equipment for the high schools.

4. To cooperate definitely and actively with state departments of education in supervising high school agriculture.

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With the agricultural colleges performing these functions satisfactorily, it may confidently be expected not only that the high schools will rapidly attain higher standards in their agricultural work, but also that the college men will be in a much better condition as to friendliness of attitude and knowledge of conditions, to give the high school work whatever credit is due.

A. C. TRUE,
J. F. DUGGAR,
A. V. STORM,
T. F. HUNT,
H. J. WATERS,
A. C. MONAHAN,
Committee.

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Supplementary Data

Entrance requirements of agricultural colleges

State	Name of institution	Location	Units of entrance requirements	
			Total required	Allowed for agriculture
Alabama	Alabama Polytechnic Institute	Auburn	14	½-2
Arizona	College of Agriculture of the University of Arizona	Tucson	15	0
Arkansas	College of Agriculture of the University of Arkansas	Fayetteville	14	½-4
California	College of Agriculture of the University of California	Berkeley	15	4
Colorado	The State Agricultural College of Colorado	Fort Collins	15	2
Connecticut	Connecticut Agricultural College	Storrs	Any four-year course	
Delaware	Delaware College	Newark	Any four-year course	
Florida	College of Agriculture of the University of Florida	Gainesville	16	1
Georgia	Georgia State College of Agriculture	Athens	14	1a
Idaho	College of Agriculture of the University of Idaho	Moscow	15	1
Illinois	College of Agriculture of the University of Illinois	Urbana	15	1-2
Indiana	School of Agriculture of Purdue University	Lafayette	15	½-1
Iowa	Iowa State College of Agriculture and Mechanic Arts	Ames	15	½-2
Kansas	Kansas State Agricultural College	Manhattan	15	½-4
Kentucky	The College of Agriculture of the State University	Lexington	15	½
Louisiana	Louisiana State University and Agricultural and Mechanical College	Baton Rouge	14	½-1
Maine	College of Agriculture of the University of Maine	Orono	14½	b

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State	Name of institution	Location	Units of entrance requirements	
			Total required	Allowed for agriculture
Maryland	Maryland Agricultural College	College Park	13	½
Massachusetts	Massachusetts Agricultural College	Amherst	14	½-1
Michigan	Michigan Agricultural College	East Lansing	15	1-3
Minnesota	College of Agriculture of the University of Minnesota	University Farm, St. Paul	15	1-4
Mississippi	Mississippi Agricultural and Mechanical College	Agricultural College	8c	1
Missouri	College of Agriculture of the University of Missouri	Columbia	15	1-2
Montana	Montana State College of Agriculture and Mechanic Arts	Bozeman	15	4
Nebraska	College of Agriculture in the University of Nebraska	Lincoln	15	d
Nevada	College of Agriculture of the University of Nevada	Reno	15	½-3
New Hampshire	New Hampshire College of Agriculture and Mechanic Arts	Durham	15	4
New Jersey	Rutgers College (the N. J. State College for the benefit of Agriculture and the Mechanic Arts)	New Brunswick	15	0*
New Mexico	New Mexico College of Agriculture and Mechanic Arts	State College	15	e
New York	New York State College of Agriculture	Ithaca	15	½-4
North Carolina	The North Carolina College of Agriculture and Mechanic Arts	West Raleigh	8	1
North Dakota	North Dakota Agricultural College	Agricultural College	15	f

* Not mentioned in any way.

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State	Name of institution	Location	Units of entrance requirements	
			Total required	Allowed for agriculture
Ohio	College of Agriculture of Ohio State University	Columbus	15	½-1g
Oklahoma	Oklahoma Agricultural and Mechanical College	Stillwater	15	h
Oregon	Oregon State Agricultural College	Corvallis	15	i
Pennsylvania	The School of Agriculture of the Pennsylvania State College	State College	14	1
Rhode Island	Rhode Island State College	Kingston	14	j
South Carolina	The Clemson Agricultural College of South Carolina	Clemson College	10	1-2
South Dakota	South Dakota College of Agriculture and Mechanic Arts	Brookings	15	1
Tennessee	College of Agriculture, University of Tennessee	Knoxville	14	2
Texas	Agricultural and Mechanical College of Texas	College Station	14	1-4
Utah	The Agricultural College of Utah	Logan	16	†
Vermont	College of Agriculture of the University of Vermont	Burlington	14½	½-2
Virginia	The Virginia Agricultural and Mechanical and Polytechnic Institute	Blacksburg	14	1
Washington	State College of Washington	Pullman	15	k
West Virginia	College of Agriculture of West Virginia	Morgantown	15	1-3
Wisconsin	College of Agriculture of the University of Wisconsin	Madison	14	1-4
Wyoming	College of Agriculture, University of Wyoming	Laramie	15	1

† No statement.

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(a) Three units allowed from district agricultural schools.

(b) Agriculture presumably allowed under a regulation permitting candidates to offer any high school subject giving training equivalent to that of certain enumerated subjects.

(c) Mississippi Agricultural and Mechanical College will require 12 units for entrance beginning the school year 1916-17.

(d) In the College of Agriculture of the University of Nebraska 6 units are allowed accredited secondary schools for elective subjects. Agriculture is not specified.

(e) The New Mexico College of Agriculture and Mechanic Arts advises students who intend to take the college course in agriculture not to take agriculture in the preparatory course.

(f) The North Dakota Agricultural College allows 5 units for elective subjects which may "consist of credits usually accepted by high schools for graduation."

(g) The College of Agriculture of the Ohio State University allows 2 units entrance credit to the male applicants who have resided on a farm two successive years after 12 years of age. Such residence must be certified on high school certificate.

(h) The Oklahoma Agricultural and Mechanical College allows 8 units for elective subjects which may consist of any work satisfactorily completed in a high school.

(i) The Oregon State Agricultural College allows 9½ units credit for elective subjects. It is presumed that agriculture may be included in such electives.

(j) The Rhode Island State College allows ½ unit credit for farm practice for entrance.

(k) The State College of Washington lists agriculture in a group of elective vocational subjects.

QUALIFICATIONS OF HIGH SCHOOL TEACHERS OF AGRICULTURE

Responsibility for prescribing the professional qualifications of teachers of agriculture rests mainly with the several state departments of education and in 13 states the departments have prescribed definite qualifications as to scholastic education and professional training for such teachers. In Michigan the qualifications of the teachers of agriculture are passed upon by the professor of agricultural education in the state agricultural college and in Minnesota they are partly prescribed by law and partly determined by the state department of education.

In several states no special requirements have as yet been formulated but there is a growing demand for a definite legal enactment or a departmental regulation requiring that teachers shall have some training in agriculture either in an agricultural college or in a normal school. Briefly stated the qualifications prescribed for teachers of agriculture, so far as they have been formulated, are as follows:

California, a four-year college course, including one and three-fifths years of agriculture.

Delaware, two years in an agricultural college.

Georgia, an agricultural college course.

Indiana, a four-year agricultural college course.

Kansas, college training and at least one year special training for teaching agriculture.

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Louisiana, graduation from an agricultural college.

Maine, a college course in agriculture or its equivalent.

Maryland, a college education in agriculture.

Massachusetts, first, farm experience of about 4 years, then college of agriculture training in most cases.

Michigan, graduation from an agricultural college and one year of professional work.

Minnesota, a bachelor of agriculture degree and thirty-six weeks of professional training.

Missouri, five to seven and one-half semester hours in agriculture.

Nebraska, a four-year agricultural college course.

New Hampshire, a four-year agricultural college course.

New Jersey, usually a four-year agricultural college course or its equivalent.

New York, a four-year agricultural college course including professional training.

Pennsylvania, high school graduation plus scientific training in agriculture and farm experience.

Utah, college graduation plus six hours in professional subjects and special training in agriculture.

Vermont, graduation from a four-year agricultural college course; for teachers in state-aided schools.

Wisconsin, at least two years of professional training and a special license.

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AGRICULTURE IN HIGH SCHOOLS IN THE UNITED STATES, SPRING 1916*

	Number of schools reporting	Agriculture introduced				Taught primarily as			School periods per year			Number of schools in which agriculture is all class room work	Number of schools giving class room and practice in school or home garden
		Prior to 1901	1901-1905 inclusive	1906-1910 inclusive	Since 1910	Informational subject	Cultural subject	Vocational subject	Minimum	Maximum	Median		
1. Alabama	23	1	1	10	11	14	3	6	48	180	120	12	11
2. Arizona	1	..	..	..	1	1	..	..	..	..	180	1	..
3. Arkansas	1	..	..	..	1	..	1	..	..	..	80	1	..
4. California	52	..	..	12	40	22	2	26	120	400	180	..	52
5. Colorado	11	..	..	..	11	9	..	2	90	360	180	3	8
6. Connecticut	2	..	..	..	2	2	..	..	200	380	300	..	2
7. Delaware	10	..	..	..	10	10	..	..	36	180	90	6	4
8. Florida	5	..	..	2	3	4	1	..	80	180	128	1	4
9. Georgia	8	..	..	4	4	4	..	4	100	180	128	3	5
10. Idaho	19	..	..	2	17	9	2	8	36	216	180	2	17
11. Illinois	65	..	1	5	59	43	2	20	40	380	180	10	55
12. Indiana	148	1	1	14	132	56	..	92	30	360	180	21	127
13. Iowa	241	..	..	16	225	187	6	48	36	360	120	34	207
14. Kansas	101	1	1	25	74	64	4	33	100	360	180	10	91
15. Kentucky	29	..	..	5	24	21	1	7	40	180	160	14	15
16. Louisiana	12	..	1	2	9	8	..	4	90	360	180	1	11
17. Maine	7	..	..	1	6	4	1	2	90	260	180	1	6
18. Maryland	10	..	..	5	5	5	..	5	108	320	180	2	8
19. Massachusetts	10	..	..	..	10	5	..	5	160	360	200	..	10
20. Michigan	76	3	..	8	65	61	2	13	108	400	190	13	63
21. Minnesota	82	1	..	12	69	54	2	26	144	360	180	6	76
22. Mississippi	21	..	..	7	14	14	2	5	90	288	160	5	16
23. Missouri	228	8	3	40	177	169	13	46	72	360	160	10	218
24. Montana	5	..	..	2	3	2	1	2	180	266	180	1	4
25. Nebraska	123	5	6	25	87	99	13	11	45	720	90	24	99
26. Nevada	4	..	..	..	4	3	..	1	144	190	180	1	3
27. New Hampshire	7	..	..	1	6	5	..	2	180	360	200	..	7
28. New Jersey	4	..	..	..	4	2	..	2	100	252	200	2	2
29. New Mexico	9	..	..	..	9	5	..	4	54	180	120	2	7
30. New York	35	..	..	2	33	4	1	30	100	800	400	..	35
31. North Carolina	7	..	..	1	6	5	2	..	128	320	180	3	4
32. North Dakota	31	..	1	3	27	24	..	7	90	540	180	..	31
33. Ohio	268	3	5	72	188	233	..	45	80	360	180	60	208
34. Oklahoma	37	..	2	8	27	30	1	6	90	252	120	4	33
35. Oregon	15	..	2	2	11	11	..	4	90	360	180	2	13
36. Pennsylvania	203	..	2	40	161	173	7	23	64	400	180	92	111
37. Rhode Island	0	..	..	..	..	..	..	..	..	..	..	..	..
38. South Carolina	2	..	..	..	2	1	1	..	72	180	90	0	2
39. South Dakota	13	..	..	2	11	13	..	..	90	185	120	2	11
40. Tennessee	14	..	..	3	11	10	1	3	90	180	140	6	8
41. Texas	41	..	..	7	34	32	3	6	60	252	120	15	26
42. Utah	13	..	..	4	9	11	..	2	108	340	180	0	13
43. Vermont	9	..	..	..	9	6	..	3	180	360	200	0	9
44. Virginia	38	..	..	17	21	36	1	1	64	360	140	21	17
45. Washington	50	..	..	6	44	29	..	21	50	360	140	4	46
46. West Virginia	20	..	..	2	18	14	..	6	90	180	180	0	20
47. Wisconsin	90	2	3	17	73	64	1	30	90	400	180	20	75
48. Wyoming	0	..	..	..	..	..	..	..	..	..	..	..	..
Total	2200	25	29	384	1767	1578	74	561	..	..	..	415	1790

*This table does not include all high schools in which agriculture is taught but does include all from which replies were received up to August 1, 1916.

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AGRICULTURE IN HIGH SCHOOLS IN THE UNITED STATES, SPRING 1916*—*Continued*

Number teaching through home project method	Number supervising the home project	Teachers of agriculture				Number pupils in agriculture						Land used for agricultural instruction not including land used at home for home projects		
						Secondary			Elementary					
		Male	Female	Total	Number with some definite education in agriculture *a*	Male	Female	Total	Male	Female	Total	None	Less than 2 acres	Two acres or more
..	..	18	7	25	10	618	441	1059	282	263	545	0	0	14
..	..	1	0	1	..	23	...	23	...	...	...	1	0	0
..	..	1	0	1	..	...	...	...	...	...	...	1	0	0
10	2	52	0	52	33	686	131	817	0	0	0	20	13	19
1	1	12	1	13	3	171	93	264	51	28	79	9	1	1
2	1	2	0	2	2	33	31	64	0	0	0	2	0	0
..	..	7	3	10	0	81	74	155	0	0	0	10	0	0
..	..	4	1	5	1	51	0	51	21	34	55	4	0	0
2	2	5	3	8	2	55	29	84	0	0	0	4	1	3
4	3	19	1	20	10	304	101	405	70	34	104	15	0	4
14	12	62	3	65	36	874	334	1208	336	464	800	52	4	9
17	9	146	12	158	51	1583	498	2081	589	96	685	143	1	4
30	25	212	33	245	64	1627	1674	3301	776	773	1549	212	18	11
2	1	88	13	101	48	843	896	1739	317	314	631	90	4	7
6	5	24	5	29	8	286	238	524	241	229	470	26	2	1
6	6	11	1	12	9	205	66	271	125	89	214	0	1	10
..	..	7	0	7	4	60	6	66	133	133	266	6	0	1
5	5	10	1	11	6	144	111	255	7	2	9	7	1	2
7	7	8	2	10	6	153	33	186	0	0	0	8	0	2
7	5	16	10	26	27	994	720	1714	261	229	490	70	3	3
14	14	82	0	82	74	1775	595	2370	1264	364	1628	32	1	49
4	1	22	7	29	17	595	281	876	91	53	144	7	2	12
3	3	210	18	228	200	1600*b*	1800*b*	3400*b*	1500*b*	1500*b*	3000*b*	281	35	12
2	2	5	0	5	2	74	51	125	0	0	0	3	0	2
10	8	98	33	131	38	1267	1370	2637	467	437	904	113	2	8
1	1	4	0	4	3	31	0	31	0	0	0	2	0	1
7	6	7	0	7	7	83	0	83	0	0	0	6	1	0
2	2	4	0	4	1	34	15	49	0	0	0	4	0	0
3	2	8	1	9	5	54	35	89	58	53	111	7	1	1
32	32	38	0	38	31	598	54	652	183	20	203	29	4	2
2	..	7	0	7	2	120	113	233	3	4	7	3	0	4
4	2	25	6	31	20	278	452	730	200	228	428	23	1	7
32	20	246	20	266	90	863	546	1409	1182	1356	2538	250	6	12
8	6	29	9	38	10	326	363	689	39	376	415	28	5	4
1	1	15	0	15	7	166	81	247	170	66	236	13	0	2
30	20	175	30	205	40	1300*b*	1380*b*	2680*b*	1500*b*	1650*b*	3150*b*	198	5	0
..	..	..	..	..	..	...	...	...	...	...	...	...	..	..
1	0	2	0	2	0	6	0	6	0	0	0	0	2	0
2	1	12	1	13	8	139	60	199	38	22	60	12	1	0
0	0	12	2	14	9	232	144	376	92	116	208	10	0	4
2	2	36	5	41	8	552	352	904	190	248	438	29	4	8
5	3	15	0	15	13	565	43	608	134	61	195	9	1	3
8	8	11	0	11	10	95	28	123	125	125	250	7	0	2
3	3	31	7	38	10	299	353	652	122	117	239	34	0	4
7	5	48	2	50	32	743	216	959	227	162	389	38	4	8
4	4	19	1	20	16	205	127	332	345	350	695	17	1	2
35	30	90	9	99	47	1641	712	2353	283	266	549	76	11	8
..	..	..	..	..	..	...	...	...	...	...	...	..	..	..
335	260	1956	247	2203	1020	22432	14647	37079	11422	10262	21684	1911	136	246

*This table does not include all high schools in which agriculture is taught but does include all from which replies were received up to August 1, 1916.

(*a*) Agricultural college graduates, part courses, short courses, summer schools, normal school courses in agriculture, etc.

(*b*) Estimated from incomplete returns.

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SPECIAL SCHOOLS OF AGRICULTURE FOR WHITE PERSONS, 1916

Location	Name of institution	Date established	Value of	
			Plant	Equipment
Alabama				
1. Abbeville	Third District Agricultural School	1898	$25,000	$2,000
2. Albertville	Seventh District Agricultural School	1892	33,000	3,000
3. Athens	Eighth District Agricultural School	1889	25,000	3,300
4. Blountsville	Ninth District Agricultural School	....	8,000	1,500
5. Evergreen	Second District Agricultural School	1894	20,000	1,200
6. Hamilton	Sixth District Agricultural School	1896	15,000	2,000
7. Jackson	First District Agricultural School	....	10,000	1,900
8. Lineville	Northeast Alabama Agricultural and Industrial Institute	....	.....	....
9. Sylacauga	Fourth District Agricultural School	1897	30,000	1,200
10. Wetumpka	Fifth District Agricultural School	1896	48,000	5,000
Arkansas				
11. College Station	State Agricultural School (District No. 4)	1910	270,000	6,000
12. Jonesboro	State Agricultural School (District No. 1)	1910	150,000	15,000
13. Magnolia	State Agricultural School (District No. 3)	1910	180,000	3,000
14. Russellville	State Agricultural School (District No. 2)	1910	120,000	2,500
California				
15. San Luis Obispo	California Polytechnic School	....	188,500	66,100
16. Davis *a*	University Farm School	*b*	*b*	*b*
Colorado				
17. Fort Lewis	Fort Lewis School of Agriculture and Mechanic Arts	1911	200,000	....
18. Fort Collins *a*	School of Agriculture of Colorado College	*b*	*b*	*b*
Connecticut				
19. Storrs *a*	School of Agriculture and Home Economics	*b*	*b*	*b*
Georgia				
20. Americus	Third District A. and M. School	1908	60,000	2,760
21. Barnesville	Sixth District Agricultural School	1908	50,000	1,500
22. Carrollton	Fourth District A. and M. School	1908	100,000	700
23. Clarkesville	Ninth District Agricultural School	1908	51,000	1,000
24. Douglas	Eleventh District Agricultural School	1907	125,000	....
25. Granite Hill	Tenth District Agricultural School	1908	65,000	3,000
26. Madison	Eighth District A. and M. School	1908	84,000	2,000
27. Monroe	Fifth District A. and M. School	1908	60,000	6,950
28. Powder Springs	Seventh District A. and M. School	1908	85,000	1,500
29. Statesboro (R. F. D. 4)	First District Agricultural School	1908	140,000	450
30. Tifton	Second District A. and M. School	1908	100,000	12,000

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SPECIAL SCHOOLS OF AGRICULTURE FOR WHITE PERSONS, 1916—*Continued*

Support			Cost of maintenance	Acres owned by school	Number of teachers			Number of pupils; Elementary			Number of pupils; Secondary			Course of study
State	County	Local			Male	Female	Total	Male	Female	Total	Male	Female	Total	Length of years
4,500	.....	1,750	6,000	40	1	..	1	...	...	...	33	...	33	4
4,500	.....	3,674	8,000	...	1	1	2	...	...	...	29	84	113	4
4,500	.....	1,835	6,300	...	3	1	4	...	...	...	68	72	140	4
4,500	.....	1,884	6,384	...	2	2	4	...	...	...	48	30	78	4
4,500	.....	1,600	5,400	...	2	2	4	...	...	...	47	50	97	4
4,500	.....	2,500	5,825	...	3	3	6	...	...	...	146	68	214	4
4,500	.....	2,051	7,451	...	3	6	9	...	...	...	65	60	125	4
....	.....	....	....	...	3	5	8	122	145	267	89	47	136	4
4,500	.....	2,100	6,900	...	2	5	7	24	24	48	59	47	106	4
4,500	.....	5,000	10,000	...	1	1	2	...	...	...	60	70	130	4
40,000	.....	....	20,000	500	7	5	12	85	40	125	163	78	241	4
40,000	.....	....	28,000	463	5	4	9	...	...	...	67	48	115	4
40,000	.....	....	25,000	400	5	2	7	30	30	60	42	38	80	4
40,000	.....	....	14,000	...	14	8	22	100	50	150	98	52	150	4
86,606	.....	36,269	108,186	311	11	4	15	...	...	...	131	45	176	4
b	.....	*b*	*b*	*b*	..	..	..	...	...	...	288	...	288*c*	3
30,000	.....	....	17,644	...	3	2	5	...	...	...	27	10	37	..
b	.....	*b*	*b*	...	..	..	..	...	...	...	318	90	408*d*	..
b	.....	b	b	...	..	..	..	...	...	...	64	...	64c	2
10,000	.....	....	7,500	300	5	4	9	...	...	...	89	12	101	4
10,000	.....	....	6,000	314	4	3	7	...	...	...	79	61	140	4
10,000	.....	....	6,500	275	4	2	6	...	...	...	100	25	125	4
10,000	.....	....	5,895	300	..	..	..	...	...	...	67	42	109	4
10,000	.....	....	5,500	300	4	3	7	...	...	...	71	29	100	4
10,000	.....	....	6,300	275	4	3	7	...	...	...	52	30	82	4
10,000	.....	....	6,925	257	5	3	8	...	...	...	45	15	60	4
10,000	.....	....	6,452	350	4	6	10	...	...	...	98	52	150	4
10,000	.....	....	5,300	240	..	..	..	...	...	...	145	75	220	4
10,000	.....	....	7,260	288	..	..	..	...	...	...	56	45	101	4
10,000	.....	....	6,500	300	..	..	..	...	...	...	74	38	112	4

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SPECIAL SCHOOLS OF AGRICULTURE FOR WHITE PERSONS, 1916—*Continued*

Location	Name of institution	Date established	Value of	
			Plant	Equipment
Idaho				
31. Moscow *a*	School of Practical Agriculture of the State University	*b*	*b*	*b*
Kansas				
32. Manhattan *a*	School of Agriculture for Graduates of the Eighth Grade	*b*	*b*	*b*
Massachusetts				
33. Northampton	Smith's Agricultural School	1908	$79,000	$8,000
34. Hathorne	The Independent Agricultural School of the County of Essex	1913	65,000	12,000
35. Segreganset	Bristol Co. Agricultural School.	1913	65,000	10,000
36. Walpole	Norfolk Co. Agricultural School.	1916	63,000	12,000
Michigan				
37. Menominee	Menominee Co. Agricultural School	1907	63,000	4,400
38. McCarron	Chippewa Co. Agricultural School	....	35,000	2,700
Minnesota				
39. Crookston	Northwest School of Agriculture	1906	325,000	40,000
40. Morris	West Central School and Station	....	250,350	22,110
41. St. Paul *a*	School of Agriculture of the University of Minnesota	*b*	*b*	*b*
Mississippi				
42. Agricultural College *a*	School of Industrial Arts of the A. and M. College	*b*	*b*	*b*
Nebraska				
43. Curtis	Nebraska School of Agriculture	1910	150,000	10,000
44. Lincoln *a*	School of Agriculture of the University of Nebraska	*b*	*b*	*b*
Montana				
45. Bozeman *a*	School of Agriculture of the Montana Agricultural College	*b*	*b*	*b*
New York				
46. Alfred	New York State School of Agriculture at Alfred University	1908	200,000	35,000
47. Canton	New York State School of Agriculture at St. Lawrence University	1906	169,000	20,000
48. Cobleskill	New York State School of Agriculture at Cobleskill	1911	75,000	10,000
49. Farmingdale	New York State School of Agriculture on Long Island	1916	510,000	37,000
50. Morrisville	New York State School of Agriture at Morrisville	1910	96,050	32,500
51. Delhi	New York State School of Agriculture at Delhi	....	.....	.....
North Carolina				
52. West Raleigh *a*	The Work Course in Agriculture of the A. and M. College	*b*	*b*	*b*
North Dakota				
53. Agricultural College *a*	School of Agriculture of the Agricultural College	*b*	*b*	*b*
54. Beach	State Agricultural High School.	....	.....	.....
55. Carrington	State Agricultural High School.	1912	.....	.....
56. Grafton	State Agricultural High School.	....	.....	.....
57. La Moure	State Agricultural High School.	....	.....	.....
58. Velva	State Agricultural High School.	1911	.....	.....

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SPECIAL SCHOOLS OF AGRICULTURE FOR WHITE PERSONS, 1916—*Continued*

Support			Cost of maintenance	Acres owned by school	Number of teachers			Number of pupils; Elementary			Number of pupils; Secondary			Course of study
State	County	Local			Male	Female	Total	Male	Female	Total	Male	Female	Total	Length of years
b	.....	b	b	b	..	..	..	...	...	...	17 0	3 0	20c 0d	.. 3
b	.....	b	b	b	..	..	..	...	...	...	407	153	560c	3
4,000	.....	7,500	11,000	94	4	..	4	...	...	...	34	...	34	3
.....	185,000	....	34,940	119	14	3	17	...	...	...	170	31	201	4
.....	.....	....	16,000	110	5	..	5	...	...	...	60	...	60	4
8,000	8,000	....	16,000	40	4	..	4	...	...	...	45	...	45	..
4,000	.....	4,000	5,115	105	3	1	4	...	...	...	31	29	60	2
.....	.....	....	.....	...	3	..	3	...	...	...	20	10	30	..
.....	.....	....	.....	...	..	..	..	...	...	...	...	...	...	3
34,000	.....	6,065	27,408	...	4	3	7	...	...	...	57	49	106	4
b	b	b	b	..	b	b	b	...	...	...	794	393	1,187c	3
b	b	b	b	...	b	b	b	...	...	...	117	...	117c	..
3,000	.....	1,500	21,500	160	3	2	5	...	...	...	56	52	108	4
b	b	b	b	b	b	b	b	...	...	...	460	343	803c	..
b	b	b	b	b	b	b	b	...	...	...	97	...	97c	..
43,000	.....	....	.....	235	16	5	21	...	...	...	165	64	229	2
36,000	.....	....	.....	...	11	5	16	37	...	37	79	70	149	2 & 3
.....	.....	....	40,000	85	6	..	6	...	...	...	...	...	...	2
50,380	.....	....	50,380	308	7	1	8	...	...	...	48	1	49	4
46,990	.....	....	48,000	200	10	4	14	...	...	...	120	73	193	2
.....	.....	....	.....	...	..	..	..	...	...	...	...	...	...	..
b	b	b	b	b	b	b	b	...	...	...	...	...	...	2
b	b	b	b	b	b	b	b	...	...	...	227	27	254c	4
.....	.....	.....	.....	.....	...	...	...	...	...	...	14	4	18	..
2,500e	2,300e	20,200e	25,000e	12½	1	2	3	35	40	75	20	...	20	..
.....	.....	....	.....	...	..	..	..	...	...	...	...	...	...	..
.....	.....	....	.....	...	..	..	..	...	...	...	23	2	25	..
1,864e	1,074e	1,296e	4,233e	...	1	..	1	14	16	30	9	21	30	..

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SPECIAL SCHOOLS OF AGRICULTURE FOR WHITE PERSONS, 1916—*Concluded*

Location	Name of institution	Date established	Value of	
			Plant	Equipment
Oklahoma				
59. Broken Arrow	Haskell State School of Agriculture	1908	$28,000	$5,000
60. Goodwell	Panhandle Agricultural Institute	1911	38,000	5,000
61. Helena	Fifth District State School of Agriculture	....	.....	.....
62. Lawton	Cameron State School of Agriculture	....	50,000	3,500
63. Tishomingo	Murray State School of Agriculture	1907	30,000	5,000
64. Warner	Connor's State School of Agriculture	1910	30,000	20,000
Pennsylvania				
65. Doylestown	National Farm School	....	.....	.....
Vermont				
66. Randolph Center	Vermont State School of Agriculture	1910	40,000	5,000
67. Lyndon Center	T. N. Vail Agricultural School and Farms	1910	.....	.....
Virginia				
68. Appomatox	Agricultural High School	1908	25,000	1,500
69. Burkeville	Hoytakah Agricultural High School	....	20,000	400
70. Chester	Third District Agricultural High School	1910	22,000	400
71. Driver	Agricultural High School	....	.....	.....
72. Elk Creek	Elk Creek Training School	....	18,000	1,000
73. Manassas	Agricultural High School	1908	8,100	2,000
74. Middletown	Agricultural High School	....	17,500	1,000
75. Hampton	Agricultural High School	....	65,000	.....
76. Lebanon	Lebanon State School	....	2,500	1,000
77. Bedford Springs	Agricultural High School	....	.....	.....
Washington				
78. Pullman *a*	School of Elementary Science of the State College	*b*	*b*	*b*
Wisconsin				
79. Marinette	Marinette County School of Agriculture	1907	.....	.....
80. Menominee	Dunn County School of Agriculture	1902	.....	.....
81. Onalaska	La Crosse County School of Agriculture	1909	60,000	10,000
82. Rochester	Racine County School of Agriculture	1912	40,000	10,000
83. Wausau	Marathon County School of Agriculture	....	.....	.....
84. Wauwatosa	Milwaukee County School of Agriculture	1912	267,600	43,138
85. Winneconne	Winnebago County School of Agriculture	1906	.....	.....

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SPECIAL SCHOOLS OF AGRICULTURE FOR WHITE PERSONS, 1916—*Concluded*

Support			Cost of maintenance	Acres owned by school	Number of teachers			Number of pupils; Elementary			Number of pupils; Secondary			Course of study
State	County	Local			Male	Female	Total	Male	Female	Total	Male	Female	Total	Length of years
14,000	.....	....	10,000	80	3	2	5	...	...	...	78	75	153	3
14,000	.....	....	8,000	78	3	1	4	...	...	...	67	60	127	3
.....	.....	....	.....	160	4	1	5	24	24	48	67	73	140	3
.....	.....	....	2,750	150	4	3	7	43	32	75	30	12	42	3
14,000	.....	2,347	1,600	...	3	2	5	60	9	69	39	7	46	3
.....	.....	....	.....	150	3	2	5	5	7	12	40	37	77	3
.....	.....	....	.....	...	..	..	..	...	...	...	...	...	...	..
10,000	.....	450	10,000	...	5	1	6	...	...	...	78	...	78	2
.....	.....	....	.....	...	6	..	6	...	...	...	...	...	...	2
3,000	.....	....	2,500	...	1	3	4	...	...	...	30	30	60	4
3,000	.....	....	.....	...	1	2	3	...	...	...	13	17	30	4
3,000	.....	....	.....	...	2	1	3	35	40	75	40	45	85	4
3,000	.....	....	.....	...	2	2	4	...	...	...	33	21	54	4
3,000	.....	....	.....	...	2	2	4	...	...	...	33	21	54	4
3,000	.....	....	2,115	...	2	2	4	15	23	38	41	29	70	4
3,000	.....	....	.....	...	2	2	4	...	...	...	13	21	34	4
3,000	.....	....	.....	...	2	6	8	...	...	...	73	127	200	4
3,000	.....	....	.....	...	2	1	3	...	...	...	18	30	48	4
.....	.....	....	.....	...	..	..	..	...	...	...	...	...	...	..
b	.....	*b*	*b*	*b*	*b*	*b*	*b*	...	...	...	405	355	760*c*	..
.....	.....	....	7,304	...	..	..	..	...	...	...	...	...	...	..
1,000	.....	300	10,000	...	4	2	6	...	...	...	50	16	66	..
6,000	8,000	500	14,500	...	1	2	3	...	...	...	37	19	56	4
.....	.....	....	4,600	...	..	..	..	...	...	...	...	...	...	..
.....	.....	....	6,800	...	..	..	..	...	...	...	...	...	...	...
67,538	.....	5,279	65,031	136	9	2	11	...	...	...	114	85	199	4
.....	.....	....	9,254	...	..	..	..	...	...	...	...	...	...	..

(*a*) Secondary schools of agriculture maintained in connection with State Colleges of Agriculture.
(*b*) Not separate from agricultural college as to funds, equipment, faculty, and number of acres.
(*c*) For the year 1914-15.
(*d*) For the year 1915-16.
(*e*) For all other work as well as teaching of agriculture.

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SECONDARY COURSES MAINTAINED BY STATE COLLEGES OF AGRICULTURE

In addition to the 12 State Colleges of Agriculture maintaining special schools of agriculture as indicated in the footnote to the table entitled "Special Schools of Agriculture for White Persons," 20 of the Agricultural Colleges maintain secondary agricultural courses corresponding in many respects to those given in some of the schools of agriculture referred to. These secondary courses are conducted by regular college instructors and vary in length from the so-called short courses of one to 14 weeks to three-year courses of 20 weeks each. In the following list are included only those courses of at least 14 weeks given primarily to boys of high school age.

University of Arkansas—Three-months course for students 16 years of age and over having common school education.

University of Florida—"Middle course in agriculture," a two-year course for those having a "good knowledge of common school branches."

University of Georgia—One-year course with no academic admission requirements.

Iowa State College—Non-collegiate course in agriculture extending over two years, open to pupils who have completed the elementary schools.

University of Maine—Two-year school course in agriculture with no entrance examinations, but primarily for students prepared for advanced high school work.

Maryland State College of Agriculture—Two-year course for those who have completed the elementary school.

Michigan Agricultural College—Two-year winter course four months each year.

University of Missouri—Two-year winter course of 14 weeks each; no academic admission requirements.

New Hampshire College of Agriculture and Mechanic Arts—Two-year course open to students with the equivalent of an elementary school education.

New York State College of Agriculture—Winter courses in agriculture of 14 weeks; no academic admission requirements.

Ohio State University—Three-year course, five months each year for students who have completed the elementary grades.

Oklahoma Agricultural and Mechanical College—Three-year course of 14 weeks each. Common school education required for admission.

Oregon Agricultural College—One-year course open to graduates of elementary schools.

Pennsylvania State College—Two-year course to pupils who have completed the elementary schools.

Rhode Island State College—Two-year course, 24 weeks each year, for students who have completed the elementary schools.

Clemson College, South Carolina—One-year course for students who have completed the elementary schools.

Utah Agricultural College—One-year course of 20 weeks, open to graduates of two-year high schools.

Texas Agricultural and Mechanical College—Two-year course.

Virginia Polytechnic Institute—Two-year course; no academic admission requirements.

University of Wisconsin—One-year course of 28 weeks for students with a "good common school education."

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On motion, the report of the committee on instruction in agriculture was received and 2,000 separates ordered printed.

E. DAVENPORT of Illinois. I rise to a question of privilege on behalf of the committee on experiment station organization and policy. Agreeable to custom, the president is about to appoint members on the standing committees. I believe that the appointment of these committees really rests with the Association as a whole, if it cares to exercise the power. It so happens that our honored president's term of office as a member of the committee expires this year. He will not reappoint himself. Director Thorne is the oldest member of the committee in point of service. He has been a member of this Association since its birth and his committee work has been extremely valuable, particularly in its relationship to the early history of the Association. I move that this Association appoint C. E. Thorne of Ohio to succeed himself as a member of the committee on experiment station organization and policy.

The motion, being seconded, was put by Dean Davenport and unanimously carried.

THE PRESIDENT. The chairman appoints the following persons as members of the committees stated for three years.

The committee on instruction in agriculture: H. J. Waters of Kansas and A. C. Monahan of Washington, D. C.

The committee on graduate study: Eugene Davenport of Illinois (in place of Howard Edwards of Rhode Island, resigned [for one year]), F. B. Mumford of Missouri, and H. J. Weber of California.

The committee on college organization and policy: R. A. Pearson of Iowa, and A. R. Hill of Missouri.

The committee on experiment station organization and policy: F. B. Linfield of Montana.

The committee on extension organization and policy: G. I. Christie of Indiana and W. R. Dodson of Louisiana.

The joint committee on projects and correlation of research: F. B. Mumford of Missouri.

The joint committee on publication of research: H. P. Armsby of Pennsylvania.

On motion, a recess was taken until 9 A. M., Thursday, November 16.

MORNING SESSION, THURSDAY, NOVEMBER 16, 1916

The Convention was called to order at 9 o'clock A. M. by President Thorne.

THE PRESIDENT. The chairman of the Executive Committee wishes to make a statement.

W. O. THOMPSON. The Association has received an invitation to meet early in October, 1917, at Springfield, Massachusetts. This invitation comes from the Massachusetts Agricultural College and from the Springfield Board of Trade. The fiftieth anniversary of the opening of the Massa-

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chusetts Agricultural College will occur at that time. The Springfield Board of Trade will play the part of host and offers ample facilities and accommodations.

A cordial invitation has also been received from St. Louis.

I am not authorized to speak definitely, but I understand that the University of Illinois wants the Association to visit Illinois at its centennial anniversary in 1918.

It is suggested that a vote of preference be taken. If such a vote were taken the Executive Committee would take that fact into consideration and carry it into effect, unless something should intervene to make such action inadvisable. The custom has been to leave the final decision to the Executive Committee, which can take cognizance of any circumstances that may develop after the Convention adjourns. The custom has been to meet in Washington every other year.

K. L. Butterfield. Entirely apart from the fact that the Massachusetts Agricultural College on October 7 to 10 will celebrate the fiftieth anniversary of its opening to students, I think that an invitation from Springfield and from New England would be entirely appropriate at this time. The last New England meeting was held in 1900. Springfield, all things considered, is perhaps the most satisfactory place in New England for a meeting. It is central with reference to railroad accommodations to the South and West, has ample hotel facilities, and possesses an environment of remarkable charm.

We want to make our anniversary as large a thing as possible. We are anxious that the precedent established at Michigan in 1907 may be followed. We have arranged a tentative program which will not interfere with the business of the Association. At present it involves a visit of the entire Association to Amherst on Wednesday, as the guests of the college. We are trying to feature a pageant which will represent the development of agriculture and some prospects in the future, which we hope will be unique and thoroughly worth while, not merely as a spectacle but as a real educational feature of our celebration. I understand that circumstances may arise, involving the business and policy of this Association, which might make it seem inexpedient for you to accept an invitation, and of course we would bow to the inevitable. I might say further that I am authorized by the presidents of all the New England land-grant institutions to say that they join most heartily in this invitation; so that, virtually, it is a New England invitation to the Association.

On motion, the Association expressed a preference in favor of meeting in Springfield, Mass., in October, 1917.

The President. The report of the bibliographer will be offered by A. C. True of Washington, D. C.

Report of the Bibliographer

Published Sources of Information about Farm Women

INTRODUCTION

The purpose of this paper is to point out the main classes of printed matter (literature is too large a word) in which attention has been given

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to the affairs of women living in the country. The points worthy of comment in this material are as follows: Extreme meagreness of investigational data; frequent but superficial treatment of the subject in books on country life, rural education, rural economy, and rural surveys; the great volume of published letters which recount the woes (rarely the joys) of individual country women; and the popularity of the farm woman as a subject of discussion among organizations representing a surprising variety of interests. Taking it as a whole, the quality of what has been said in print is an inadequate, if not actually false, index of the really good work that has been done for and by country women and their organizations. Problems have been worked out in individual cases and the results applied in practice, but as yet the economic, sociological and psychological principles underlying this work have not been analysed and formulated, standards such as are used in farm management work have not been worked out by surveys, accumulated practical experience has not been summed up and presented in a systematic way for the guidance of others.

In 1908, country life and the importance of the woman's part in it became an object of general public attention in the United States through the enquiries of the United States country life commission appointed by President Roosevelt. Before that time several agencies were in the field for furthering the interests of women on farms, the most notable of which were the National Grange (with a widespread organization and many women members and officers), women's institutes and college extension work, such, for example, as was carried on by the New York State College of Agriculture at Cornell University by means of reading courses for farmers' wives. Organizations and extension courses had been increasing in strength and numbers in proportion to local or regional interest. Since 1908, however, the interest has been all but universal, and hardly a book or an organization dealing with any phase of rural life or women's affairs has omitted its paragraph or chapter or address on the subject of the woman on the farm. Most of these have quoted freely from the report of the commission and from each other, and reiterate the same statements. Women's congresses, agricultural, educational and home economics associations, missionary boards, and the Young Women's Christian Association have held sessions to discuss the farm woman, have included her in their surveys, or have appointed committees to seek her out and offer their aid; and she herself, invited by societies, farm papers and questionnaires, has proved a voluble letter writer, communicative of her hardships and her needs. With it all, however, very little has been said.

The references that follow are merely a guide to the general classes of literature in which material must be sought. There has been no effort to make the lists complete. In the absence of any specific statistical and investigational material, publications have been included in Section II in which the work of women on the farm has been treated incidentally or indirectly. Insignificant as these appear, it is believed that they represent practically all that has been done in this line. With this exception publications referred to are merely representative and serve to illustrate how scattered and how slight the material actually is, and how varied are its sources. For the most part the selection has been made from literature issued since 1907 and of general international interest or dealing only with the United States and Canada. A few references relating to England and Ireland are included in the groups on organization and on the vocational

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aspect of agriculture for women, a subject which is coming into especial prominence in England at this time. References to books on food, cooking and home economics in general have not been included. This class of literature is well known and almost none of it is written with a view to farm conditions. Specific applications of the principles of home economics to these conditions are more likely to be found in the agricultural press and in extension publications as indicated in the appended list. The subjects of the construction of farm homes, and their lighting, heating, water supply, etc., have also been omitted, as well as those of health, sanitation and recreation in rural districts. These subjects are well represented among the books of interest to farm women that are given in the bibliographies listed. An attempt has been made to select material on women's interests that applies specifically to farm conditions and material on farm life that applies specifically to women. This distinction has proved difficult.

The omission of material relating to other European countries should not be understood to imply its insignificance. The education of women in agriculture and home economics in Europe has long been given serious attention and many organizations of farm women exist either independently or in connection with farmers' organizations of national scope. Farm women's clubs attained an especially great development in Belgium, interestingly described by Paul deVuyst in his book "Woman's Place in Rural Economy." Information concerning European organizations and means of education for farm women and references to literature on these subjects may be found in the Monthly Bulletin of Economic and Social Intelligence, established by the International Institute of Agriculture at Rome in 1910.

LIST OF PUBLISHED SOURCES OF INFORMATION ABOUT FARM WOMEN

I. Books, articles, and bulletins dealing exclusively with the subject (1-11).
II. Sources of statistical and economic information (12-28).
III. Agriculture as a vocation and agricultural training (29-36).
IV. Home economics and extension work (37-92).
V. Farm women's organizations (93-102).
VI. Books on country life, education, etc., dealing in part with the subject of farm women (103-117).
VII. General organizations that have given attention to farm women (118-130).
VIII. Bibliographies for or about farm women (131-156).

I. Books, Articles and Bulletins Dealing Exclusively with the Subject.

(1) Buell, Jennie. One woman's work for farm women; the story of Mary A. Mayo's part in rural social movements. VI, 78 p., Boston, Whitcomb and Barrows, 1908.

An account of Mrs. Mayo's work for the National Grange.

(2) Crow, Martha Foote. The American country girl. [XIV], 367 p., New York, Frederick A. Stokes Co., [1915].

Outlines the life of a country girl in its various relationships. Describes average conditions as learned from correspondence with country girls and advises as to the daughter's share of the work, the equipment of the kitchen, household administration, the girl's wage, dress budget, education, opportunities and recreation. Has a chapter on the woman as the "farm partner." See also (137).

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(3) ——— The young woman on the farm. (Cornell Univ., College of Agr. Cornell reading courses v. 3, no. 63, p. 205-212, May 1, 1914).

(4) Mitchell, Edward Bedinger. The American farm woman as she sees herself. (U. S. Dept. Agr. Yearbook 1914, p. 311-318).

A commentary on (5), (6), (7), and (8).

(5) U. S. Department of Agriculture. Domestic needs of farm women. 100 p. Washington, Govt. Print. Off., 1915. (U. S. Dept. Agr., Off. of Secy. Report 104).

Classified extracts from letters by farm women in reply to a circular of inquiry. Suggestions to farm women and information about activities of the U. S. government of interest to them are given in appendices A-G, (p. 79-100) which are identical in text (though not in pagination) with appendices of Reports 103 (8), (105) (7) and 106 (6). See also note to (149).

(6) ——— Economic needs of farm women. 100 p. Washington, Govt. Print. Off., 1915. (U. S. Dept. Agr., Off. of Secy. Report 106).

See notes to (5), (149), (150). Appendices A-G in (5), (6), (7), (8) are identical in text but not in pagination. Appendices H-K give additional information on marketing, rural credits, etc.

(7) ——— Educational needs of farm women. 88 p. Washington, Govt. Print. Off., 1915. (U. S. Dept. Agr., Off. of Secy. Report 105).

See notes to (5), (149), (151).

(8) ——— Social and labor needs of farm women. 100 p. Washington, Govt. Print. Off., 1915. (U. S. Dept. Agr., Off. of Secy. Report 103).

See notes to (5), (149), (152).

(9) U. S. Secretary of Agriculture. The woman on the farm. (U. S. Dept. of Agr. Annual Reports 1912/13, p. 31-33).

(10) Vuyst, Paul de. Le rôle social de la fermière: Son éducation professionnelle; les réunions de fermières; leur organisation à l'étranger. Renseignements pratiques. 2. ed. 194 p. Bruxelles, Albert Dewit, 1911.

Discusses the role of the farmer's wife in the family, in the household, in work on the farm and in associations. Gives an account of means of education provided for country women in Europe, the United States and Canada, especially through the agencies of women's institutes and clubs and with special reference to the history and development of farm women's clubs in Belgium. Bibliography: p. [167]-194. See also note to (154).

(11) ——— Woman's place in rural economy; a study in sociology. Translated by Nora Hunter. XI, 151 p. London, Glasgow and Bombay, Blackie and Son, 1913.

A translation of the above with an introduction by Sir Robert Patrick Wright and additions to the bibliography, p. 121-151, which has also been rearranged. See also note to (155).

II. Sources of Statistical and Economic Information.

(12) Arnold, Jacob Hiram. How a city family managed a farm. 28 p. Washington, Govt. Print. Off., 1911. (U. S. Dept. Agr. Farmers' Bul. 432).

Has a paragraph on "the housework problem" and makes incidental mention of the labor contributed by mother and daughters in bookkeeping, management of the poultry and dairy, etc.

(13) Bailey, Ilena May. A study of the management of the farm home. (Jour. of Home Econ., v. 7, no. 7, p. 348-353, Aug.-Sept., 1915).

Describes cost accounting studies undertaken to determine the apportionment of working hours of farm women among various occupations, the amount of produce furnished for home consumption and the value of articles bought. Summarized results from a few of the records are briefly reported.

(14) Cooper, Thomas Poe. The factors and cost of board on Minnesota farms. (Jour. of Home Econ., v. 1, no. 1, p. 43-51, Feb., 1909).

Includes estimate of value of women's work as a factor in the cost of board.

(15) Funk, Warren Clemmer. Value to farm families of food, fuel

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and use of house. 36 p. Washington, Govt. Print. Off., 1916 (U. S. Dept. Agr. Bul. 410).

Treats of the farmer's living as related to the total farm income. Takes into consideration the work performed by the women in production and preservation of food materials and the value of household labor in relation to the cost of board on the farm.

(16) ——— Value of a woman's work in the farm home. (North Dakota Farmer, v. 16, no. 12, p. 6, June 15, 1915).

Account of work done by the women on a 320 acre farm in North Dakota. "On many farms the labor contribution of the farmer's wife or daughter is the limiting factor between success or failure."

(17) ——— What the farm contributes directly to the farmer's living. 21 p. [Washington, Govt. Print. Off., 1914]. (U. S. Dept. Agr. Farmers' Bul. 635).

Considers the farmer's living in relation to the total farm income. Based on data furnished for the most part by farmers' wives from 483 families. Estimates the value of household labor and cost of board on the farms studied.

(18) Holmes, George Kirby. Wages of farm labor. Nineteenth investigation, in 1909, continuing a series that began in 1866. 72 p. Washington, Govt. Print. Off., 1912. (U. S. Dept. Agr., Bur. of Statistics, Bul. 99).

"Part II. Domestic labor of women on farms" [1902-1909]: p. 66-71.

(19) —— Supply of farm labor. 81 p. Washington, Govt. Print. Off., 1912. (U. S. Dept. Agr., Bur. of Statistics, Bul. 94).

"Outdoor labor of women": p. 13-15.—"Women and negroes in agriculture": p. 16.—"Percentage of women" [in agricultural labor]: p. 22.—"Decline of women's work since 1871": p. 27-29. Additional data included in statistical tables.

(20) Merritt, Eugene. The agricultural element in the population. (Quart. Pub. of the Amer. Statist. Soc., v. 15, new ser., no. 113, p. 50-65, March, 1916).

Conclusions based on returns of the 13th Census of the United States. Compares data for rural and urban districts with reference to population (birth, death, marriage and migration statistics) according to sex and country of nativity and points out relationship between the use of machinery and woman's work on the farm.

(21) Spillman, William Jasper. A successful poultry and dairy farm. 40 p. Washington, Govt. Print. Off., 1909. (U. S. Dept. Agr. Farmers' Bul. 355).

The labor performed by women in the management of the house and in other work was among the factors contributing to the success of the farm. Poultry work was almost entirely managed by them and proved equal to the dairy as a source of income.

(22) Thompson, Carl William, and Warber, Gustav Paul. Social and economic survey of a rural township in southern Minnesota. VIII, 75 p. Minneapolis, 1913. (Univ. of Minn. Studies in economics no. 1).

Woman's share in outdoor work as well as in housework estimated in percentages (p. 11-15). Other data about women given incidentally.

(23) U. S. Department of Commerce. Bureau of the Census. Thirteenth census of the United States . . . 1910. [Reports] 11 v. Washington, Govt. Print. Off., 1914.

Data on the number of women in urban and rural districts by ages, marital condition, etc., is contained in v. 1-3. Population: General report and analysis (v. 1); Reports by states (v. 2-3).

Data on the number of women engaged in agricultural pursuits by age, nativity, geographical distribution, etc., is contained in v. 4. Population: Occupation statistics.

(24) U. S. Department of Commerce and Labor. Bureau of the Census. Statistics of women at work, based on unpublished information derived from schedules of the twelfth census, 1900. 399 p. Washington, Govt. Print. Off., 1907.

"Farmers": p. 122-128. Data regarding women in agricultural occupations also included in general tables, p. 34-39.

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(25) U. S. Immigration Commission. Occupations of the first and second generations of immigrants in the United States. Fecundity of immigrant women. VI, 826 p. Washington, Govt. Print. Off., 1911.

Prepared by Joseph A. Hill from unpublished data in the Bureau of the Census. Tables relating to female breadwinners (including agricultural pursuits): p. 71-79, 234-251, 342-431, 534-635, 654-671. "Fecundity of women": p. 731-826. Compares data for rural and urban districts in Ohio, Rhode Island and Minnesota for immigrant and for native women.

(26) Warber, Gustav Paul. Social and economic survey of a community in northeastern Minnesota. VIII, 115 p. Minneapolis, 1915. (Univ. of Minn. Current problems no. 5).

Compares country and village conditions including data on women's work, home conveniences, recreation, and social life.

(27) Warren, George Frederick, and Livermore, Kenneth Charles. An agricultural survey: townships of Ithaca, Dryden, Danby and Lansing, Tompkins county, N. Y. p. [375]-568. Ithaca, N. Y., March, 1911. (Cornell Univ., Agr. Exper. Sta. Bul. 295).

"Women as farmers": p. 544-548, 568.

(28) Weld, Louis Dwight Harvell. Social and economic survey of a community in the Red River Valley. VI, 86 p. Minneapolis, March, 1915. (Univ. of Minn. Current Problems no. 4).

Includes statement of percentage of work performed by farmers' wives, and other data about farm homes.

III. Agriculture as a Vocation and Agricultural Training.

(29) Babcock, Ernest Brown. Opportunities in agriculture for women. (Univ. of Cal. Jour. of Agr., v. 2, no. 1, p. 17-22, Sept. 1914).

Summarizes replies of four successful women farmers in California to inquiries as to desirable amounts of land and capital and necessity for special training for women engaging in specific branches of agriculture in California.

(30) Dawson, Laura Blanchard. Horticulture as a profession for women. (Mass. Hort. Soc. Trans. 1910, pt. 1, p. 67-78).

Reviews opportunities for horticultural training in Germany and England, and the various branches of horticulture in which women have succeeded, and enumerates institutions in the United States giving instruction in horticulture to women.

(31) Stone, John Lemuel. Opportunities for women in agriculture. (Cornell Countryman, v. 14, no. 1, p. 32-33, 56-57, Oct., 1916).

Compares relative advantages and disadvantages of men and women in agriculture and enumerates special lines in which women are most successful, based on results of personal inquiries and upon statistics for occupations given by the 13th Census of the United States, 1910.

(32) Wilkins, *Mrs.* Roland. The work of educated women in horticulture and agriculture. (Jour. of the Board of Agr. [Great Britain], v. 22, no. 6, p. 554-569, Sept., 1915; no. 7, p. 616-642, Oct., 1915).

Results of an inquiry by the Women's Farm and Garden Union to ascertain existing opportunities for women in agriculture. Discusses training available and prospects for employment and gives data on training, experience, success and failure of women actually engaged in agricultural and horticultural work.

(33) Wolseley, Frances Garnet, *viscountess*. In a college garden. XVII, 255 p. London, John Murray, 1916.

Under the form of discursive description of work at the College of Gardening, Glynde, Sussex, a plea is made to educated, thinking women to join the profession of gardencraft and to encourage increased opportunities for obtaining training.

(34) ——— Women and the land. XI, 229 p. London, Chatto and Windus, 1916.

Points out what can be done by women of all classes toward the improvement of agricultural conditions in England both in the present and future, and the need of better training of women for farm life.

(35) Women's Educational and Industrial Union, Boston. Studies

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of the economic relations of women. v. 1. Vocations for the trained woman. New York, Longmans, Green and Co., 1914.

"Opportunities for women in agriculture" by Eleanor Martin: v. 1, pt. 2, p. 3-69. A study of the probable success of women in agriculture in Massachusetts and the conditions of capital and education affecting that success.

(36) ——— Appointment bureau. Poultry raising as a vocation for women. 10 p. Boston, Women's Educational and Industrial Union, [1911]. (*Its* Bulletin, Vocation ser., no. 5).

Based on interviews with successful men and women poultry farmers. Sums up the sources of information, nature and scope of the work, personal qualifications and training, profits and opportunities.

For additional references see (19), (23), (24), (27), (98), (102), (123), (130).

IV. Home Economics and Extension Work for Farm Women.

(37) The agricultural press.

Most of the weekly farm papers published in the United States have a woman's section which gives attention to household affairs. A monthly paper of similar character called "The farmer's wife" is published in St. Paul, Minn.

American Association of Farmers' Institute Workers. Proceedings of annual meetings 4th-20th, 1899-1915.[1] Washington, D. C., 1899-1915.

A standing committee on women's institutes was appointed in 1905. Annual reports of this committee and special articles on women's institutes are as follows:

(38) 4th, 1899. "The home department of farmers' institutes" by Anna Barrows: p. 668-672.

(39) 5th, 1900. "Cooking schools at farmers' institutes" by Helen Armstrong: p. 241-244.

(40) 6th, 1901. "Women's institutes" by Blanche Maddock: p. 46-49.

(41) 7th, 1902. "Teaching domestic science in the rural districts" by S. Evelyn Breed: p. 91-101.

(42) 8th, 1903. "How the institutes can bring the most good to the girls: Women and their share of the work" by Blanche Maddock: p. 90-93. —"Women's institutes" by Laura Rose: p. 93-95.—"Organization of institutes for women" by Agnes Smith: p. 95-97.

(43) 9th, 1904. "Women's institutes" [with discussion] by Mrs. Noble King [and others]: p. 63-71.

(44) 10th, 1905. "Women's institutes" by Blanche Maddock: p. 76.

(45) 11th, 1906. "Report of standing committee on women's institutes": p. 37-40.—"What the Illinois Association of Domestic Science stands for, its objects and its work" by Mrs. I. S. Raymond: p. 40-41.

(46) 12th, 1907. "Report of committee on women's institute work": p. 53-54.—"The woman lecturer" [with discussion] by Mary A. Wallace and Mary E. Lee: p. 55-57.

(47) 13th, 1908. "President's address" by Tait Butler: p. 7-9. (The closing paragraphs mention work for women).—"Report of committee on women's institutes": p. 33-34.—"Report of the committee on address of the president": p. 69-70.

(48) 14th, 1909. "Report of committee on women's institutes": p. 24. —"The practicability and advisability of holding separate institutes for women and of organizing rural women's clubs" by G. A. Putnam: p. 40-42.

[1] Proceedings were published as follows: 4th in 58th Annual Report of the New York State Agricultural Society for 1898; 5th, 1900, in Wisconsin Farmers' Institutes bulletin 14, 1900; 6th-17th, 1901-1912, are U. S. Department of Agriculture, Office of Experiment Stations bulletins 110, 120, 138, 154, 165, 182, 199, 213, 225, 238, 251, 256. Subsequent numbers were separately published by the Association.

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—"What form of organization would be best adapted for women's institutes and rural clubs for women, and how should the expenses of such clubs be met?" by L. A. Merrill: p. 42-45.

(49) 15th, 1910. "President's address" by G. A. Putnam: p. 22-25. Mentions women's institutes in Ontario.—"Report of the committee on women's institutes": p. 53-55.—"Special and separate institutes for women" by Jennie Buell; p. 55-57.—"Plan of organization of women's institutes" by Jennie C. Barlow: p. 57-60.—"Objects of women's institutes" by Mrs. H. J. Patterson: p. 61-63.—"Objects of women's institutes" by Mrs. Henrietta W. Calvin: p. 63-64.—"Method of conducting women's institutes" by Helen Wells: p. 64-65.—"Qualifications of teachers for women's institutes" by Martha Van Rensselaer: p. 65-67.

(50) 16th, 1911. "Report of committee on women's institutes": p. 53-54.

(51) 17th, 1912. "Report of women's institutes in Canada" by Mrs. Laura Rose Stephens: p. 16-17.—"Organizing and maintaining institutes for young people and for women" [with discussion] by Irma Matthews and [T. B. Parker]: p. 70-72, 75-77.

(52) 18th, 1913. "Report of committee upon women's institutes": p. 24-27.—"Women's institutes in Canada" by Mrs. Horace W. Parsons: p. 27-29.—"The obligation of the farmers' institute to the country woman, the country boy and the country girl" [with discussion] by W. J. Kennedy [and others]: p. 49-52.—"The proportion of state institute funds that should go to the support of institutes for women" by Mrs. W. N. Hutt: p. 61-63.—"Model equipment for a local institute for women with a model program" by Helen Louise Johnson: p. 63-68.—"Report of standing committee on women's institutes": p. 68-71.—"How the organizing of local institutes for women can best be effected" [with discussion] by Mrs. H. M. Dunlap [and others]: p. 71-75.—"The advisability of the organization of a section for women in the American Association of Farmers' Institute Workers" [with discussion] by Ida S. Harrington [and others]: p. 75-83.

(53) 19th, 1914. "Rural organization for women" [with discussion] by Ida S. Harrington [and others]: p. 65-69.—Report of the committee on farmers' institutes for women": p. 72-73.—"Helping farm women" by Mary E. Dillard: p. 75-78.—"The relation of home economics to farmers' institutes" by Winifred J. Robinson: p. 78-80.—"Teaching home economics at farmers' institutes" [with discussion] by Anna Barrows [and others]: p. 80-86.

(54) 20th, 1915. "Report of standing committee on women's institutes": p. 77-79.—"Women's institutes in the Province of Ontario" by G. A. Putnam: p. 79-82.—"Extension service for women" by E. G. Peterson: p. 82-85.—"Extension work for rural women" by Mamie Bunch: p. 85-91.—"Extension work for rural communities" by Mary E. Sweeney: p. 92-96.—"Home demonstration and its possibilities" by Gertrude McCheyne: p. 96-99.—"Equipment for extension work in home economics" by Alva B. Martin: p. 100-103.—"Rural work in home economics in Missouri" by May C. MacDonald: p. 104-105.—"Organization and methods in home economics" by Mrs. H. W. Calvin: p. 134-140.—"Home demonstrations" by Mary E. Creswell: p. 141-146.

Association of American Agricultural Colleges and Experiment Stations. Proceedings of the annual conventions.

Articles on extension work for women in the Proceedings since 1909 are as follows:

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(55) 25th, 1911. "[Summary of the] report of the committee on extension work: Women's work" [with discussion]: p. 36.—"Woman's work—its place and importance in extension work" [with discussion] by Neale S. Knowles [and others]: p. 198-203.

——— Report of the committee on extension work. . . 1911.[1]

"Women's work": p. 33.

(56) 26th, 1912. "Report of the committee on extension work: Home economics": p. 66-67.

(57) 27th, 1913. "Things the college should undertake to accomplish through its extension division" [with discussion] by J. H. Worst [and others]: p. 161-169.

Speaks of modernizing the home, labor saving devices, etc.

(58) 28th, 1914. "Report of the special committee to study the types of extension organization and policy in the land-grant colleges" [Statement of the number of colleges in which extension work in home economics is organized]: p. 261.—"Extension work in home economics" by Miss E. B. Kelley: p. 133-138.

(59) 29th, 1915. "Organization and methods in home economics" [with discussion] by Mrs. H. W. Calvin [and others]: p. 241-247.—"Home demonstrations" [with discussions] by Mary E. Creswell [and others]: p. 247-253.

(60) Barrows, Anna. The farm kitchen as a workshop. 20 p. Washington, Govt. Print. Off., 1914. (U. S. Dept. Agr., Farmers' Bul. 607).

(61) ——— Extension course in vegetable foods, for self-instructed classes in movable schools of agriculture. 78 p. Washington, Govt. Print. Off., 1916. (U. S. Dept. Agr., Bul. 123).

(62) Extension publications on home economics issued by state universities, colleges, and normal schools.

Especially those issued since July, 1914, by the state agricultural colleges, and the Florida State College for Women, Tallahassee, Fla., The Hampton Normal and Agricultural Institute, Hampton, Va., and the Winthrop Normal and Industrial College, Rock Hill, S. C. Among institutions issuing extension publications in home economics previous to the above date are University of Illinois, New York College of Agriculture at Cornell University, Oregon Agricultural College, University of Texas, Hampton Normal and Agricultural Institute.

(63) Hamilton, John. Farmers' institutes for women. 16 p. Washington, Govt. Print. Off., 1909. (U. S. Dept. Agr., Off. of Exper. Stas. Circ. 85).

(64) Journal of home economics; published monthly by the American Home Economics Association. v. 1-8, Baltimore, Md., 1909-1916.

An extension section was organized by the association in 1915. The Journal contains many articles on home management, food, labor saving devices, education in home economics, etc., written for country conditions by college extension workers.

(65) Mitchell, Margaret Johnes. Course in cereal foods and their preparation, for movable schools of agriculture. 78 p. Washington, Govt. Print. Off., 1908. (U. S. Dept. Agr., Off. of Exper. Stas., Bul. 200).

Women's institutes. Canada.

In addition to the individual reports listed below, notices and brief accounts of women's institutes in Canada are regularly published in the Agricultural Gazette of Canada v. 1, no. 1, Jan., 1914, to date.

(66) Alberta. Women's Institutes. Report of the superintendent, 1915. (*In* Annual Report of the Department of Agriculture of Alberta).

Reports of this Department for 1913 and 1914 also contain data on women's institutes which were organized in 1912.

[1] Not printed in the Proceedings but as a separate pamphlet of 42 pages.

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(66a) British Columbia. Women's Institutes. Annual report, [2d], 1914.

Organized in 1909 by the British Columbia Department of Agriculture whose Bulletins 35, 36, 37, 41, 43, 46, 47, 50, 52, 53, 54 were issued for women's institutes.

——— ——— The women's institute quarterly, v. 1. Oct., 1915-July, 1916.

(66b) Manitoba. Home Economics Societies. Annual report, 1913/14-1915. (*In* Reports of the Manitoba Department of Agriculture).

Organized in 1910 by the Manitoba Agricultural College whose reports for 1910-1912/13 contain information antedating the above.

(67) New Brunswick. Women's Institutes. Report [of the 2d annual convention], 1913.

Organized in 1911 by the New Brunswick Department of Agriculture whose Bulletins 5-10 were written expressly for women's institutes.

——— ——— Report of the supervisor, 1913-1914. (*In* Report on Agriculture for the Province of New Brunswick, 1913-1914).

(68) Nova Scotia. Women's Institutes. [Report], 1-3, 1913-1915. (*In* Annual Reports of the Secretary of Agriculture of Nova Scotia).

(69) Ontario. Women's Institutes. Report 1898/99-1914/15.

1898/99-1904/05 published as Part 2 of Report of Farmers' Institutes; 1907/08-1914/15 issued in two parts; accounts antedating the above are in Reports of Farmers' Institutes 1895/96-1897/98.

——— ——— Handbook for the use of women's institutes in Ontario; compiled by G. C. Creelman. 120 p. Toronto, Ontario Department of Agriculture, [1903?].

(70) Prince Edward Island. Women's Institutes. Report of supervisor, 1913-1915. (*In* Annual Reports of the Department of Agriculture of Prince Edward Island).

(70a) Quebec. Home Makers' Clubs. Handbook. [Quebec, MacDonald Agricultural College, 1914].

The first of these clubs was organized as a woman's institute Jan. 27, 1911; organization under the above name was effected at a provincial convention, Feb., 1914.

(70b) Saskatchewan. Home Makers' Clubs. [Report], 1911-1914. (*In* Annual Reports of the Director of Agricultural Extension, Saskatchewan, which are published in Annual Reports of the Department of Agriculture of the province).

Women's institutes. United States.

In many parts of the United States women's sections of farmers' institutes have been organized, or subjects relating to the home and to women's work have been presented at the general session of farmers' institutes. The organization and progress of this work may be traced in the annual reports of the Office of Experiment Stations, 1908-1912, which include a section on farmers' institute work, in Circular 85 of the same office (63), in Bulletins 83 and 269 of the U. S. Department of Agriculture and in Proceedings of the American Association of Farmers' Institute Workers, 1904-1915 (43-54) in the reports of its committee on women's institutes. The following list of published proceedings of farmers' institutes containing women's work was compiled from somewhat fragmentary material.

(71) Georgia, University of. Director of farmers' institutes. Reports, 1908-1910. (Most of these are published as bulletins of the University of Georgia).

1903-1906 contain a few addresses for women; 1908-1910 have a section on women's work; subsequent reports contain no addresses for women.

(72) Illinois Association of Domestic Science. [Annual report], 1899-1906/07. (*In* 4th-12th Annual Reports of Illnois Farmers' Institutes).

Title varies; addresses given before the Association also printed in the Annual Reports of Farmers' Institutes; see also (45) and the following (73).

(73) Illinois Farmers' Institutes. Department of Household Science. Yearbook, 1899-1915.

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1899-[1907?] had no title; 1908-1909 are Ill. Farm. Inst. Bul. 12, 14; 1899-1908, name of the organization was Illinois Association of Domestic Science; much of the material in the [Anual reports] of this association (72) and in the Yearbooks is substantially the same.

——— ——— Circular 1-2, 1909-1911.

(74) Indiana Farmers' Institutes. [Reports and papers], 1888/89-1906/07. (*In* Annual Reports of the Indiana State Board of Agriculture, v. 30-48).

Contain addresses for women.

(75) Kentucky. Farmers' Institutes. [Reports], 2-9, 1907-1914.

Title varies; general sessions include subjects for women.

(76) Michigan. Farmers' Institutes. Institute bulletin 1-21, 1894/95-1914/15.

Women's sessions provided for by the constitution; meetings for women reported in a separate section of the bulletin.

(77) Minnesota. Farmers' Institutes. Annual, 3-28, 1890-1915.

Women's subjects represented either by separate section or as a part of general program.

(78) Missouri Home Makers' Conference. [Proceedings] 1908-1915. (Published by the Missouri State Board of Agriculture in its Annual Reports 1908-1915 and also (except 1908 and 1914) in its Monthly Bulletins v. 7, no. 3, March, 1909; v. 8, no. 2, Feb., 1910; v. 9, no. 2, Feb., 1911; v. 10, no. 4, April, 1912; v. 11, no. 3, March, 1913; v. 13, no. 4, April, 1915).

(79) Montana. Farmers' Institutes. Annual reports 1-12, 1902-1914.

A section on domestic science contained in 1st, 1902; 3d, 1904; and 5th, 1905/06.

(80) New York. Bureau of Farmers' Institutes. [Reports and papers], 1891-1914/15.

1891-1899 published in 51st-59th Annual Reports of the New York State Agricultural Society; subsequent issues published by the New York State Department of Agriculture as separate reports and as Bulletins 28, 32, 37, 42, 44, 50, 62, 74.

(81) North Carolina. Farmers' Institutes. Annual report, 1906-1915.

Women's branch organized in 1906; its proceedings published in Reports of Farmers' Institutes issued as N. C. Dept. Agr., Bul. v. 27, no. 10, Oct., 1906; v. 28, no. 10, Oct., 1907; v. 29, no. 10, Oct., 1908; v. 30, no. 10, Oct., 1909; v. 31, no. 10, Oct., 1910; v. 32, no. 12, Dec. 1911; v. 33 no. 12, Dec., 1912; v. 35, no. 1, Jan., 1914; v. 36, no. 1, Jan., 1915; v. 37, no. 1, Jan., 1916.

(82) North Dakota. Farmers' Institutes. Annual, 8-12, 1908-1912, 1915.

Some of these numbers contain addresses for women.

(83) Ohio. Farmers' Institutes. Annual report, 1-19, 1890/91-1908/09.

Published by the State Board of Agriculture; contain addresses for women.

(84) Oklahoma. Woman's auxiliary [of Farmers' Institutes]. Report 1909/10-1910/11. (In Biennial Reports of the Oklahoma State Board of Agriculture, 2d, 1909/10, p. 90-92; 3d, 1910/11, p. 25-27).

(85) Pennsylvania. State Board of Agriculture. Proceedings of the Farmers' Institute Normal Institute, 1899, 1903-1915. (Penn. Dept. Agr., Bul. 52, 115, 131, 137, 151, 157, 169, 182, 197, 213, 229, 241, 253, 267).

Title varies; contain addresses for women.

——— ——— Papers read at farmers' institutes in Pennsylvania, 1905/06-1907/08. (Penn. Dept. Agr., Bul. 161, 179).

Contain addresses for women.

(86) Tennessee. East Tennessee Farmers' Convention and Institute. [Proceedings], 1912-1913.

Women's interests provided for in general sessions; accounts and addresses published by the Tennessee Department of Agriculture in Tennessee Agriculture v. 1, no. 3, 4; v. 2, no. 7.

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(87) ——— Middle Tennessee Home Makers' Association. Proceedings 1st-4th, 1911-1914.

Organized in 1911 in connection with Middle Tennessee Farmers' Institutes; proceedings published by the Tennessee Department of Agriculture in its Biennial Report for 1911-1912 and in Tennessee agriculture v. 1, no. 9, v. 2, no. 11, v. 3, no. 11.

(88) Texas. Farmers' Institutes. Proceedings of meetings, 1-5, 1911-1915. (Tex. Dept. Agr. Bul. 21, 27, 35, 39, 48).

Separate section for women 1915; previous to that meeting addresses of interest to women were included in general sessions.

(89) Utah. Farmers' Institute. Annual 1-13, 1896/97-1909/10.

Addresses for women included in some of the general sessions.

(90) Virginia. Farmers' Institutes. Proceedings of the 9th session, 1912.

Contains Reports of Woman's Auxiliary to the Virginia State Farmers' Institute.

(91) West Virginia. Farmers' Institutes. Annual 1-[2], 1910-1911. (West Va. Bd. Agr. Reports No. 18, 24).

Contains addresses for women.

(92) Wisconsin. Farmers' Institutes. Bulletin 6-29, 1892-1915.

Contains addresses given at separate sessions for women.

——— ——— Women's bulletins [1]-8, [1908?]-1915.

[1?]-[6?] had the title: Cook book.

For additional references see (11), (13), (94), (97), (119-121), (124), (125).

V. Farm Women's Organizations.

(93) The agricultural press.

Some of the weekly farm papers such as the Ohio Farmer, the Progressive Farmer, the Oklahoma Farmer-Stockman, etc., encourage systems or federations of local clubs of which the paper serves as an official organ through its woman's section.

(94) Carver, Thomas Nixon. The organization of a rural community. (U. S. Dept. Agr. Yearbook 1914, p. 89-138).

"Committee on household economics": p. 135-138. The plan of organization presented is intended as a general guide to be followed by any particular community so far as it seems to meet its needs.

(95) Galpin, Charles Josiah and Sawtelle, Donald Wing. Rural clubs in Wisconsin. Madison, Aug., 1916. (Wis. Agr. Exper. Sta. Bul. 271).

"The farm women's club": p. 34-41.

International Congress of Farm Women.

"Aims to improve the conditions, financial, physical, social and spiritual of agricultural homes." Was organized as an auxiliary of the International Dry Farming Congress at Colorado Springs in 1911 with representatives from twenty-eight states, Canada and Belgium, and held a second meeting at Lethbridge, Canada in 1912, in connection with the International Dry Farming Congress. A third meeting independent of this congress was held at Ghent, Belgium, in 1913. This meeting was attended by representatives of practically all European countries, Canada, and the United States. In October of the same year another meeting was held at Tulsa, Oklahoma, announced in its official organ as the "Third meeting of the International Congress" but referred to by members as the "American International" or the "American section of the International Congress." A meeting was held in Wichita, Kansas, in 1914 in connection with the International Dry Farming Congress but connection with the latter was severed in the same year and affiliation with the Farmers' National Congress was announced. From January, 1912, to December, 1914, "Dry Farming," the monthly official organ of the International Dry Farming Congress, served also as the organ of the International Congress of Farm Women and contains brief accounts of its activities. Unofficial accounts of the second meeting may be found in the Forty-fifth Annual Report of the Missouri State Board of Agriculture for 1912, p. 272-275, 587-593 and of the meeting at Tusla in the Forty-sixth Annual Report of the Missouri State Board of Agriculture, 1913, p. 457-463, and in the report of the Ninth Annual State Farmers' Institute, Kentucky, 1914, p. 38-46. Official reports of the meeting at Colorado Springs and at Ghent were published as follows:

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(96) ——— 1st, Colorado Springs, 1911. Official proceedings. 64 p. Lethbridge, Canada, International Dry Farming Congress, 1912.

(97) ——— Troisième congrès international des cercles de fermières, Gand., 12-15 Juin, 1913. Rapports. 4v. Bruxelles, Comité national des fédérations des cercles de fermières, 1913.

Contents: Sec. 1. Les associations de fermières.—Sec. 2. Le rôle professionnel de la fermière.—Sec. 3. La fermière, mère de famille et ménagère.—v. 4. Comptes rendus.

(98) Missouri Women Farmers' Club.

Organized in 1910; the personal superintendence and management of a farm made a condition of membership. Proceedings published in connection with those of other Missouri organizations meeting during "Farmers' week" in the annual reports of the Missouri State Board of Agriculture as follows: 1st meeting, 1910, in 43d Annual Report, p. 195-200; 2d, 1911, in 44th Annual Report, p. 289-306; 3d 1912, in 45th Annual Report, p. 576-595; 4th, 1913, in 46th Annual Report, p. 449-463; 5th, 1914, in 47th Annual Report, p. 305-322.

(99) Plunkett, Horace, Pilkington, Ellice and Russell, George. The United Irishwomen; their place, work and ideals. VI, 50 p. Dublin, Maunsel and Co., [1911].

An account of the organization and its plans for development. Society was founded to further the interests of agriculture and industries, domestic economy and social and intellectual development in rural Ireland. Affiliated with the Irish Agricultural Organization Society.

(100) Reclamation record; published monthly by the U. S. Reclamation Service, Washington, D. C.

Beginning with v. 5, no. 7, July and August, 1914, each number has a section on "Project women and their interests" in which news is given of the women's clubs organized on "reclamation projects." A list of clubs with names of officers is given in v. 5, no. 7.

(101) Woman's Educational and Industrial Association [of Texas]. [Proceedings], 1901-1914.

Account of organization in Farm and Ranch, v. 20, no. 32, p. 6-7, Aug. 10, 1901; Proceedings in Reports of the Texas Farmers' Congress 1901, p. 138-159; 1902, p. 175-183; 1903, p. 173-174; 1905, p. 243-250; 1906, p. 97-105; 1907 (Tex. Dept. Agr. Bul. 3) p. 136-141; 1908 not published; 1909 (Tex. Dept. Agr. Bul. 10) p. 308-319; 1910 (Tex. Dept. Agr. Bul. 16) p. 271-285; 1911 (Tex. Dept. Agr. Bul. 22) p. 225-233; 1912 (Tex. Dept. Agr. Bul. 29) p. 231-241; 1913 not published; 1914 (Tex. Dept. Agr. Bul. 40) p. 141-155).

(102) Women's National Agricultural and Horticultural Association. [Purpose, program of first conference and directory of members]. 16 p. [Cheltenham, Pa.], May, 1914.

Its aim is to promote agricultural and horticultural interests among women. Affiliated with the Women's Agricultural and Horticultural International Union, London. In May, 1916, the name of the society was changed to Women's National Farm and Garden Association.

——— Quarterly. v. 1-3, Nov., 1914-Nov., 1916. London, 1914-1916.

Contains articles on gardening, bee keeping, training in agriculture for women, etc., notes of shows and exhibitions and reviews of books on agricultural subjects.

For additional references see (1), (10), (11), (45), (48), (53), (66b), (70a), (70b), (87), (104), (106), (110), (114), (117) and entries under Section VII.

VI. Books on Country Life, Education, etc., Dealing in Part with the Subject of Farm Women.

(103) Bailey, Liberty Hyde. The country-life movement in the United States. XI, 220 p. New York, The Macmillan Co., 1911.

"Woman's contribution to the country life movement": p. 85-96.

(104) [Burrell, *Mrs.* Caroline French]. The complete club book for women. . . by Caroline French Benton [*pseud.*]. 302 p. Boston, The Page Co., 1915.

"The work of the rural club"; p. 118-130.

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(105) Butterfield, Kenyon Leech. Chapters in rural progress. IX, 251 p. Chicago, Univ. of Chicago Press, 1908.

"Opportunities for farm women": p. 162-169.

(106) Carney, Mabel. Country life and the country school. XXII, 408 p. Chicago and New York, Row, Peterson and Co., [1912].

The following chapters include special mention of farm women: "The farm home": p. 18-38.—"The Grange": p. 72-84 (especially p. 77-78). See also (135).

(107) Carver, Thomas Nixon. Principles of rural economics. XX, 386 p. Boston, New York, etc., Ginn and Co., [1911].

"Relation of the sexes in farming communities": p. 22-25.—"The family builder": p. 337-338.

(108) Cubberley, Ellwood Patterson. Rural life and education. XIV, 367 p. Boston, New York and Chicago, Houghton Mifflin Co., [1914].

"Better homes" [with special reference to labor saving conveniences]: p. 115-117.

(109) Fiske, George Walter. The challenge of the country; a study of country life opportunity. [XVI], 283 p. New York and London, Association Press, 1912.

Written at the request of the International Committee of Young Men's Christian Associations. "Country life leadership: A challenge to college women": p. 249-263.

(110) Gillette, John Morris. Constructive rural sociology. New ed., rev. and enl. IX, 408 p. New York, Sturgis and Walton Co., 1916.

"Women's clubs": p. 292-295. Women mentioned incidentally on p. V-VI, 50, 51, 106, 113, 117, 126, 129, 130, 131, 133, 161, 227, 232, 237, 257, 258, 265, 289, 297, 359.

(111) Leake, Albert H. The means and methods of agricultural education. XXIII, 273 p. Boston and New York, Houghton Mifflin Co., 1915.

"The woman on the farm": p. 201-218.

(112) Phelan, John. A brief course in rural economics and rural sociology. 43 p. Eau Claire, Wis., Eau Claire Book and Stationery Co., [1913].

Principles of rural economics and rural sociology briefly stated for the instruction of teachers. "The farm home": p. 22-23.

(113) Plunkett, Horace. The rural life problem of the United States. XI, 174 p. New York, The Macmillan Co., 1910.

[The position of women in rural life]: p. 139-141.

(114) Stern, Renée Bernd. Neighborhood entertainments. XV, 297 p. New York, Sturgis and Walton Co., 1910. (The young farmer's practical library).

"Girls' clubs": p. 55-59.—"Women's clubs": p. 69-105.

(115) Taft, Anna Benjamin. Community study for country districts; a method of investigating a small village or section of the open country. 137 p. New York, Missionary Education Movement of the United States and Canada, 1912.

"Study V. Women on the farm": p. 43-47. An introductory page followed by a list of questions for use in making a survey.

(116) U. S. Country Life Commission. Report. . . Special message from the President of the United States transmitting the report of the Country Life Commission. 65 p. Washington, Govt. Print. Off., 1909. (U. S. 60th Cong., 2d Sess. Sen. Doc. 705).

"Woman's work on the farm": p. 46-47. The introduction by Theodore Roosevelt also mentions this subject on p. 8-9.

(117) U. S. Department of Agriculture. Annual reports for the year ended June 30, 1915. Washington, Govt. Print. Off., 1915.

"Organization work among farm women": p. 392. (Part of the report of the chief of the Office of Markets and Rural Organization).

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VII. General Organizations that have given Attention to Farm Women.

(118) **American Farm Management Association. Record of the Proceedings, 1915.**

"Utilization of waste on the farms" by W. S. A. Smith: p. 18-25. Includes waste in the home, especially the waste of labor caused by lack of proper equipment.

Conference for Education in the South. Proceedings.

(119) ——— **16th, Richmond, Va., 1913.**

"Education of women in the country": p. 66-98. Includes "The present day common school is inadequate for the training of women to meet present day rural problems" by H. L. Whitfield.—"The country school as it is and the tragic consequence for the woman on the farm" by Leila A. Russell.—"What the rural school should do for women in the country" by T. J. Coates.—"How can the country school as it now is reach and help the women on the farm? (Report . . . by chairman of the committee)" by Eva Reichardt.—"How more adequate training would better the life of the country woman" by Mary E. Frayser.—"How to relieve the drudgery of women on the farm" by Joe Cook.—"Home economics and help for the homemaker" by Benjamin F. Andrews.—"Home economics and help for the home manager" by Isabel Ely Lord.—"Social life in the country for women" by Mrs. M. C. Roark.—"The awakening of farm women" by Mrs. W. N. Hutt.

(120) ——— **17th, Louisville, Ky., 1914.**

"Conference of country women"; p. 18-63. Includes "Report of the committee on household management" by Mary E. Frayser.—"Menus for a country home" by Margaret Whittemore.—"How can we induce the country housewife to plant a more varied vegetable garden?" by Mrs. J. S. McKimmon.—"How to make ready money" by Mary E. Creswell.—"The hopes and aspirations of the country woman" by Mabel C. Williams.—"What the farm woman wants and needs" by Eva Reichardt.—"Community work for the home" by Helen Kinne.

Congrès international d'agriculture.

Papers presented and resolutions passed at these congresses since the second, 1891, have dealt with the desirability and the means of education for women in agriculture and home economics, favoring this as a means of checking rural exodus. In recent congresses the subject has been treated as follows:

(121) ——— **8th, Vienna, 1907. [Organisation et rapports]. 4 v. Vienna, 1907.**

v. 1. "[Comptes rendus] Sec. II-A. Rap. VI": p. 215-218.—v. 4. "Rapports Sec. II-A, Rap. VI": "Die land-und hauswirtschaftliche ausbildung der frauen" by Richard von Baratta. 5 p.—"Le rôle social de la fermière et son éducation professionnelle" by P. de Vuyst. 12 p.

(122) ——— **9th, Madrid, 1911. Organisation, réglements et programme. Madrid, 1912.**

La mission morale et sociale de la fermière moderne" by Carlos da Cunha Continho: p. 148-160.—Les cercles de fermières" by P. de Vuyst; p. 173-178.

(123) ——— **10th, Ghent, 1913. [Rapports]. 6 v. Bruxelles, 1913.**

v. 2. Communication F. "The Women's Agricultural and Horticultural International Union. H. R. H. Princess Louise, president." 4 p.—v. 4. "L'désertion des campagnes" [Resolutions]; p. 322-323. Resolution no. 9 relates to the education of country women.

Congrès international d'enseignement ménager.

(124) ——— **1st, Fribourg, 1908. 2 v. Fribourg, 1908.**

v. 1. "Rapports" includes "Wie richtet man wanderkochschulen ein und was soll ihr sweck zein?" by Fräulein Zehnder; p. 373-379.—"L'enseignement ménager agricole sous la forme de cours itinérants d'un mois en Bretagne" by Comtesse de Kéranflech-Kernezne: p. 380-384.—"Le bon goût a la campagne: l'éducation du bon goût par les écoles ménagères agricoles" by T. Bondroit: p. 640-648.—Die ländliche haushaltungsschule (hühnerzucht, gartenbau) als teiweise lösung des so wichtigen problems der entvölkerung des landes; die immer wachsenden bedeutung der nach den praktischen methoden des hauswirtschaftlichen unterrichts geschulten bäuerin" by Ida Schuppli: p. 667-678.—"Welch grosse wohltat es für die gesundheit der mädchen ist, ein jahr in einer landlichen haushaltungsschule zu verbringen" by Fräulein Mooyer, p. 679-682.—"L'enseignement ménager dans les associations de fermières" by Mlle. L. D'Hondt: p. 683-691.

(125) ——— **2nd, Brussels, 1913. 5 v. Bruxelles, 1913.**

[v. 3] "Enseignement ménager aux adultes ou annexé à l'enseignement moyen."—[v. 5]. "Le progrès de l'enseignement ménager dans les divers pays."

General Federation of Women's Clubs. Official reports of biennial conventions.

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Reports of its committees on home economics and on library extension show that both the general and the state federations have taken interest in country women and their clubs. In addition to the reports of these committees and of the several states, recent volumes contain the following articles:

(126) ——— 10th, 1910. "Glimpses of rural conditions in America"; p. 416-441.

A summary of letters received from farm women in reply to a circular of inquiry.

(127) ——— 12th, 1914. "The woman on the farm" by Lutie Stearns: p. 207-214.

Tells of the significance of books to isolated women.

(128) International Council of Women. Report on the quinquennial meeting, Rome, 1914. 515 p. Karlsruhe i. B., [1914].

"Meeting on the life of women in rural districts" p. 249-262. Presided over by the Countess of Aberdeen; Hungary, Denmark, Germany, Canada, Italy and the United States were represented.

(129) National Grange of the Patrons of Husbandry. Journal of proceedings of the annual sessions.

Women have had rights of membership and have held office in the Grange since its beginning. Increased interest in women's work has been shown since 1907 as evidenced by the reports of the "Worthy Ceres" in the journal for 1907, 1908, and 1909 and by the reports of the standing committee on home economics since its appointment in 1910. See also (1), (106), (130).

(130) Pennsylvania Rural Progress Association. Proceedings of the country life conference under the auspices of the Philadelphia Society for Promoting Agriculture, March, 1912. 224 p. Philadelphia, [1912].

"The farm women and her problems" by Martha Van Rensselaer: p. 191-195. —"Women and the Grange" by Hannah T. Lyon: p. 197-199.—"Cooperation in the farm home" by Jean Kane Foulke: p. 199-201.—"A horticultural school for women" by Jane Haines: p. 201-202.—"The civic clubs and the farmer's wife" by Mrs. Owen Wister: p. 202-205.—"City women cooperating with country women" by Mrs. Rudolph Blankenburg: p. 217-218.

For additional references see (38-54), (55-59), (64).

VIII. Bibliographies for and about Farm Women.

(131) The Arizona farmer's bookshelf. 4 p. Tucson, Nov., 1914. (Univ. of Ariz., College of Agr., Extension Service. Ariz. Farm Advisor, v. 1, no. 1).

Classified lists of books with annotations. "The farm home": p. 4.

(132) Blaney, Louise. Books and periodicals for the farm. (Better Farming; pub. by the Nev. Agr. Exper. Sta., v. 2, no. 3, p. 7-13, March, 1914).

Classified lists for adults and children on general and agricultural subjects. "A suggested list of books on home economics": p. 9.

(133) Bradenburg, Samuel Jacob. One hundred good books for country readers. 14 p. Oxford, Ohio, Miami University, Jan., 1913.

Classified lists including "The home," "Housekeeping," "Food and cookery," "Children and nursing," "Health and welfare."

(134) Burr, Walter. Community welfare in Kansas. 34 p. Manhattan, Kans., Oct., 1915. (Kans. Agr. College, Extension Bul. 4).

"Available bulletin material on community projects": p. 28-33 includes "Household economics": p. 32-33.

(135) Carney, Mabel. Country life and the country school. XXII, 408 p. Chicago and New York, Row, Peterson and Co., [1912].

"Bibliography, Sec. IV: Farm home and women on the farm": p. 391. See also (106).

(136) Comstock, Laura and Palmer, Cornelia. Classified bibliography of home economics books and pamphlets for study and reference work. p. 33-44. Orono, Me., Feb., 1913. (Me. Univ., College of Agr., Extension Dept. Timely helps for farmers, v. 6, no. 6).

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(137) Crow, Martha Foote. The American country girl. [XIV], 367 p. New York, Frederick A. Stokes Co., [1915].

"Bibliography": p. 363-367. Classified lists including among other topics urban and country life, household efficiency, women in industry, biographies of women, poetry, games and recreation. See also (2).

(138) Hall, Frank Henry. What shall the farmer read? p. 2559-2590. Albany, Sept., 1915. (N. Y. State Dept. Agr. Bul. 75).

Classified lists of books on agriculture and allied subjects with an introduction on professional and agricultural reading, and its value to the farmer's family. "Domestic economy": p. 2589-2590.

(139) Illinois Farmers' Institute. Department of household science library. (Ill. Farmers' Institute, Dept. of Household Sci. Yearbook 1915, p. 219-225).

A classified list of 290 books relating to all phases of home life with directions for borrowing them from the library.

(140) Illinois, University of. College of Agriculture. Extension Service. List of books for the farmer's library. Ed. 2. 22 p. Urbana, Feb., 1916. (Univ. of Ill. Bul. v. 13, no. 24; also numbered Univ. of Ill., College of Agr., Extension Service Form 29).

Annotated, classified lists. "Household science and rural hygiene": p. 17-19.

(141) Indiana State Library. Bibliography on country life, the farm and the small town. 11 p. Indianapolis, Dec., 1915. (Ind. State Libr. Quart. v. 10, no. 4).

Classified; directions given for borrowing the books from the library. "The home": p. 6.

(142) Iowa State College of Agriculture and the Mechanic Arts. Agricultural Extension Department. Valuable books and bulletins on home economics. 11 p. Ames, 1915. (Iowa State College of Agr., Extension Dept., Home Econ. Circ. 1915/16, no. 6).

(143) A list of books, documents and articles on country life problems including agricultural economics, practical agriculture, agricultural credit, woman on the farm, country church, rural schools; compiled by the Tacoma and Seattle Public Libraries for the twenty-eighth meeting of the Washington Educational Association. . . Oct., 1914. 32 p. Tacoma, 1914.

"Woman on the farm": p. 19-21.

(144) Massachusetts Agricultural College. Extension service. Announcement and list of available literature on home economics. [8] p. Amherst, July, 1915. (Mass. Agr. College, Extension Service, Mass. Bul. for Farm Women no. 1).

Classified, annotated lists including books and bulletins.

(145) ——— ——— Some good books for farm women. 1 p. Amherst, 1916. (Mass. Agr. College, Extension Service. Library leaflet 23).

(146) Pennsylvania State College. Department of Agricultural Extension. Books for school and farm libraries. Feb., 1915. (Penn. State College, Dept. of Agr. Extension. Extension Bul., v. 2, no. 5, p. 2-11).

"Home economics": p. 4. "Farmers' bulletins" [for a home economics collection]: p. 8.

(147) Severance, Henry Ormal. Books for farmers and farmers' wives. 24 p. Columbia, Mo., April, 1912. (Univ. of Mo., Bul., Library Ser., v. 1, no. 4).

Classified lists of books on agriculture and home economics; gives a few of the best books on each subject with directions for borrowing them from the library.

(148) U. S. Department of Agriculture. List of free and available publications of the United States Department of Agriculture of interest to farm women. 11 p. [Washington, Govt. Print. Off.], 1913.

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Includes publications on gardening, dairying, etc., as well as those relating to the home.

(149) ——— Domestic needs of farm women. 100 p. Washington, Govt. Print. Off., 1915. (U. S. Dept. Agr., Off. of Secy. Report 104).

See also note to (5). "Appendix A. General suggestions for development by farm women individually or through their organizations": p. 79-89. Suggestions interspersed with references to publications of the U. S. Department of Agriculture.—"Appendix C. List of free or available publications of the United States Department of Agriculture of interest to farm women": p. 90-95.—"Appendix D. The government book store": p. 95-97. Gives information about the Office of the Superintendent of Documents.—"Appendix E. Publications on school and home education and the care of children" by the U. S. Bureau of Education, the U. S. Indian Office and the U. S. Children's Bureau: p. 97-98.—"Appendix F. Sanitation and hygiene. Publications of the United States Public Health Service": p. 98-99.

(150) ——— Economic needs of farm women. 100 p. Washington, Govt. Print. Off., 1915. (U. S. Dept. Agr., Off. of Secy. Report 106).

See also notes to (5), (6), (149). Appendices identical in text with the above but with pagination as follows: App. A, p. 69-80.—App. C, p. 81-86.—App. D, p. 86-88.—App. E, p. 88-89.—App. F, p. 89-90.

(151) ——— Educational needs of farm women. 88 p. Washington, Govt. Print. Off., 1915. (U. S. Dept. Agr., Off. of Secy. Report 105).

See also notes to (5), (149). Appendices identical in text with the above with pagination as follows: App. A, p. 67-77.—App. C, p. 78-83.—App. D, p. 83-84.—App. E, p. 85-86.—App. F, p. 86-87.

(152) ——— Social and labor needs of farm women. 100 p. Washington, Govt. Print. Off., 1915. (U. S. Dept. Agr., Off. of Secy. Report 103).

See also notes to (5), (149). Appendices identical in text with the above but with pagination as follows: App. A, p. 79-89.—App. C, p. 90-95.—App. D, p. 95-97.—App. E, p. 97-98.—App. F, p. 98-99.

(153) Van Rensselaer, Martha. Reading in the farm home. p. 85-108. Ithaca, N. Y., Feb., 1912. (Cornell Univ., College of Agr., Cornell Reading Courses, v. 1, no. 9).

"A suggested list of books on home economics" p: 100-101. Other lists of interest to women.

(154) Vuyst, Paul de. Le rôle sociale de la fermière. Son éducation professionnelle; les réunions de fermières; leur organisation à l'êtranger. Renseignements pratiques. 2 éd. 194 p. Bruxelles, Albert Dewit, 1911.

"Quelques livres pour jeunes fermières": p. [167]-175. Classified by language (Dutch and Flemish, French) and sub-arranged by subject.
"Quelques livres pour bibliothèques centrales de fermières et pour le personnel enseignent": p. 176-194. Classified according to a different subject arrangement from the preceding, with subdivision by language, including English and German as well as Flemish, Dutch and French.
See also (10).

(155) Vuyst, Paul de. Woman's place in rural economy; a study in sociology. Translated by Nora Hunter. XI, 151 p. London, Glasgow and Bombay, Blackie and Son, 1913.

"Some books of interest to women farmers": p. 121-151. Classified by subject subdivided by language. Some English books are given that do not appear in the French edition. The subjects include bookkeeping, education, natural history, chemistry, botany, as well as the lighter branches of agriculture, house construction and all branches of home economics. See also (11).

(156) Wallace, DeWitt. Getting the most out of farming. A selected list of publications of value to the farmer and farmer's wife available for free distribution by the government and state experiment stations. 128 p. St. Paul, Webb Pub. Co., 1916.

A revised list to be issued annually. "Farm houses and conveniences": p. 46. "Foods": p. 54-55. "Women's clubs": p. 125.

On motion, the report of the bibliographer was received.

K. L. Butterfield. Would it be practicable, or, if practicable, in any way incongruous with his other duties, if the bibliographer were asked to furnish members of the Association from time to time, say two or three times during a session, a list of bills that are introduced into Congress

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bearing in any way directly or indirectly upon agriculture, together with very brief statements as to their contents? Many of us would appreciate such information, because almost every year at these meetings someone will remark, to our surprise, that such and such a bill has been introduced.

A. C. TRUE of Washington, D. C. We file copies of all bills pertaining to agriculture in our office and could readily send to members of the Association lists giving numbers and brief resumés regarding purposes, etc.

On motion, the bibliographer was requested to send synopses of bills introduced in Congress concerning agricultural matters to the members of the Association.

THE PRESIDENT. "Scientific Management as Applied to Farm, Home and Manufacturing Plants" will now be discussed by Dean C. R. Jones of West Virginia.

SCIENTIFIC MANAGEMENT AS APPLIED TO THE FARM, HOME AND MANUFACTURING PLANTS

BY C. R. JONES

The subject of scientific management is so broad that its detailed application to a single industry would transcend the limits of a paper, while the topic assigned as it appears on the printed program covers the entire field; hence this discussion is confined to "The Extension of Scientific Management as Applied to Manufacturing Plants to the Farm and the Home."

No attempt will be made to review the history of scientific management nor to recount its specific applications, its successes, its failures or its modifications. As a basis for discussion it seems necessary, however, to state briefly the principles of scientific management as advanced by its exponents in the manufacturing industries.

Frederick W. Taylor, who is the accredited father of the movement, and who coined the name, says that "Scientific management is a system devised by industrial engineers for the purpose of subserving the common interests of employers, workmen and society at large, through the elimination of wastes, the general improvement of the process and methods of production and the just and scientific distribution of the product."

The Taylor system is based on four fundamental principles:

First: The development of a science for each element of a man's work, which replaces the old rule-of-thumb or traditional method.

Second: Scientific selection, training, and development of the workman where in the past he chose his own work and trained himself the best he could.

Third: The hearty cooperation of the management with the men to insure all of the work being done in accordance with the principles of the science which has been developed.

Fourth: An almost equal division of the work and responsibility between the management and the workmen; the management to take over all work for which they are better fitted than the workman, while in the past almost all of the work and the greater part of the responsibility were upon the men.

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The first principle, that of developing a science for each element of a man's work, involves among other things—though not necessarily in the order in which they appear:

1. A careful analysis to determine before the work is undertaken, what is to be accomplished.

2. The determination by experimentation or from accurate existing data of the best way to accomplish the work in the quickest time and at the lowest cost. This includes the routing and labor saving methods for reducing the amount of handling by hand.

3. The employment of the best machines, the best facilities and the best tools, and the best speeds and loads at which the machines should run for each operation. This can only be determined in many instances after long experimentation, as in the case of cutting of metals.

4. Time and motion study of representative workmen by trained observers for each element of the operation, by which all unnecessary movements are eliminated and the best and easiest movements are adopted.

The proper number of steps or subdivisions of the work are determined and the proper time allowed for each step is found after making allowances for rational rest periods and legitimate delays. This study may lead to redesigning or rearranging the tools and appliances to suit the man. The proper task or rate per day is thus fixed at which a man may work year after year without undue fatigue and without injuring his health.

Knowledge which is assumed to be accurate and scientific is thus substituted for guess work. The number of variables are many, including those of the workers, the observers, the materials and appliances dealt with and the surroundings, and at best it may only be possible to approach scientific accuracy.

The second principle, involving the selection and training of the workmen, assumes that before they are placed on a task basis they are carefully selected and then trained to do a number of operations by a skilled set of teachers, and that they are then given the highest and best paid jobs which they are capable of handling. Great stress is laid on the adaptation and training a man for a given job rather than allowing him to choose something for which he is unfitted.

The third principle, close, intimate and personal cooperation between the management and the men, is given as the essence of scientific or task management, is bringing the science and the workmen together, through constant help and watchfulness of the management and through paying each man a large daily bonus for working fast and doing what he is told to do. In this system emphasis is placed on the man rather than on the machine, though its opponents take the opposite view.

To carry out the provisions of the fourth principle the management or the number of non-productive workers is largely increased. Nothing is left to chance. Instead of assigning a task to a workman and giving him the responsibility of doing all the planning as well as the physical work, the workman is handed a complete set of written instructions from the planning room stating how the work shall be done, the tools that he shall use, the speed at which he shall operate the machine, the number of pieces that shall constitute a day's work and the rate of pay.

In a complete installation the old time foreman is replaced by eight functional foremen:

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1. Route work or order-of-work clerk. 2. Instruction card clerk. 3. Time and cost clerk. 4. Disciplinarian. 5. Gang boss. 6. Speed boss. 7. Repair boss. 8. Inspector. All of these functional foremen must be specialists at their respective functions and be prepared constantly to teach and help the individual workman.

Much of the mechanism of the so-called scientific or functional management has been purposely left out in this brief description, but enough has been said to discuss its possible extension to industries other than manufacturing plants. Enough has been said, too, to show that a complete system of functional management is only possible for large plants and that the system would have to be modified for small plants. In practice the ideal has perhaps never been realized for all departments of any plants; the mechanism always must be modified to suit special conditions, even though the ideal may be kept strictly in mind.

Reducing scientific management to its lowest terms, it consists in determining the best and most economical method of performing a given task and then devising a system of management by which the task can be done in the best and most economical way. Robbed of its mechanism the fundamental principle of the Taylor system of scientific management has a general application though functional management must be limited to the larger establishments. Applying this principle to farm management, there is an essential agreement with the definition given by Warren, namely: "It is the aim of farm management to unite business principles with scientific principles into such a system that the farm as a whole shall yield the greatest profit."

Granting that the underlying principles are the same, the problems presented are widely different. The influences exerted by manufacturing plants on home life are only indirect. The farm is in most cases an essential part of the farmer's home. He indulges in hobbies and individual preferences, which would have no place in mechanical plants where sentiment is reduced to a minimum. The manufacturing industries are mainly carried on through large aggregations of capital and labor while the farm is the prevailing unit in agriculture and may employ no labor other than that of the farmer and his family. At most, the number of regular farm hands employed will seldom be more than one or two. A manufacturing plant specializes on one product or on few products and the employees are specialists. The successful farmer must produce a great variety of products. A manufacturing plant devotes the same space year in and year out to the same product and has a definite routing system; the successful farmer must rotate his crop and change his routing system each year. In a manufacturing plant the aim is to keep the machines used in production in constant operation and by the same set of workmen; on the farm, the continuous operation of any machine or tool is limited to short periods. However, the same principle applies. A machine rusts out as fast as it wears out and the more uses to which it can be applied the greater the return on the investment. A manufacturing plant subdivides and reduces its operations as far as possible to work of a special character, trains men for each special job and keeps them constantly on the same job until discharged or promoted. The farmer must change his work and that of his men from day to day or week to week. In applying the principles of scientific management to farms, these fundamental differences and others that have escaped my notice must be taken into consideration.

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The farm management movement does not seem to have been directly influenced by the Taylor system. Indirectly it has greatly advanced the movement by its effect on the plants which manufacture farm machinery and farm implements, and probably through the stimulation which the Taylor system gave to cost accounting and efficiency of production. This influence has been unconscious rather than conscious. Yet the movement has had a logical evolution and the trend is toward the same ideal as that advanced in the Taylor system.

First, there was the scientific investigation relating to individual elements or problems by agricultural colleges, agricultural experiment stations, manufacturers of farm appliances, seed growers and to a very limited extent by farmers themselves. In the case of the manufacturing plants most of the experimentation had to be carried on in the plants themselves. Otherwise the processes were parallel. This investigation is far from complete and is still in progress. The facts ascertained for a single industry were assembled and systems of management relating to the best methods applying to that industry as a whole were devised and put into practice.

Still this was not enough. The farm had to be treated as a unit and diversified crops were necessary to success. From the study of separate treatises on the different industries in the farm group, exaggerated ideas were likely to be entertained as to the relative importance of the several factors, and it was necessary that these factors be harmonized. The individual movements finally came together into a general movement of farm management which makes use of the facts developed for the different elements but assigns them to their proper place in the general scheme for farm economy.

The development of a science for each element in the farm processes can be and is being made with as great accuracy as variations in climate, topography, soils, seasons and sizes of farms will admit. The development and selection of proper machinery, tools and appliances for widely varying conditions is a large problem but not an unsurmountable one. Manufacturers are cooperating with the farmer and are perhaps contributing even more than their share to experimental work. Farm buildings and the proper layout of the farm and routing systems can be standardized to a limited extent. Even motion and time studies can be made and a normal day's work determined, but their practical application would be limited. Such studies are in many cases valuable even though they can not be enforced.

The selection and training of farm workers presents a problem that finds no parallel in the manufacturing industry. It is true a farmer may, to some extent, select his own hired help, but he is a law unto himself. State and Federal Governments are spending more money for the benefit of the farmers than for that of any other class. In the past everyone else seems to have been working for improved agricultural conditions, but now the farmer also seems to be awake to his opportunities. He must from his isolated position teach himself or upon his own initiative accept instruction from others. There are many agencies ready, willing and anxious to assist him. From catalogues and trade literature a great deal of valuable information can be obtained without cost. Only a few days ago a large package of pamphlets relating to the use of cement on the farm came to me without solicitation. Federal and state departments of agriculture,

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the agricultural experiment stations, and the extension departments are glad to send free literature on almost any subject. Then there are the farmers' institutes, extension schools, and, if he is willing to spend a little money, the farmers' short courses at the agricultural colleges, the farm journals and standard books on farming. Besides these there are two other agencies which to the individual farmer may be more valuable than all the others combined, namely, the farmers' club and the county or district agent. If a farmer is not well informed, it is his own fault; but experience has shown that he can only be reached through a long campaign of education. Even at best, owing to the great variety of tasks that a farmer must do, much of the work will be done inefficiently. The inertia of traditional methods are not easily shaken off.

Cooperation between management and employer in the sense of its application to scientific management does not fit farm conditions unless we consider a neighborhood or a group of farmers as a unit. We may have cooperative purchasing and selling agencies and there may be cooperation in the ownership and use of machinery.

Functional management—the fourth of Taylor's principles—is not generally applicable to the farm. I know of one farm where one member of the family has charge of crops, another of orchards, another of the dairy, and still another the poultry; but few establishments warrant even this subdivision of authority. If this idea were carried out to its full logical extent, the small farm would go out of existence and would be replaced either by large corporate establishments or community farming, in which the work would be so subdivided that each worker could be assigned to tasks which he was best qualified to perform. No amount of increased efficiency to my mind would compensate society for the sacrifice of giving up the farm and the home as the fundamental units of our social organization.

There is a sort of possible and practical cooperation between the farmer and the county or district agent analogous to the principle of cooperation and functional management of the Taylor system, but no one county agent could be so well trained in all lines of farm work as to be competent to give universal advice. The staff of extension workers behind the county agent made up of specialists, partially corrects this deficiency and makes the analogy more complete.

One hesitates to invade the home, the most sacred of our institutions, and to speak of it in terms of efficiency; but there are certain mechanisms which contribute so largely to the happiness, the convenience, and economy of the home that we may at least enter the kitchen, along with the iceman and the butcher's boy, and take a peep into the dining room, and we might slip in with the plumber for further explorations. Without entering into the inner shrine we can, without irreverence, discuss the mechanical features, the business side, the architectural arrangements and those things which may relieve housekeeping of its drudgery and at the same time may contribute to the economy of the household.

If an improved appliance or a better system of management is proposed for a manufacturing plant, the decision is based on the answer to the question: "Will it pay?" If for a farm we ask two questions: "Will it pay?" and "Can I afford it?" If for the home, the question that should decide it is: "Can I afford not to make the desired improvement?" Unfortunately the decision is usually based on "Can you get along without it?"

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It is not considered justifiable in a manufacturing plant to install a labor saving device unless it pays in dollars and cents, though the welfare, contentment, goodwill, and physical fitness of employees is considered of great importance to employers, from a monetary point of view. On the farm such devices, even if they do not effect a saving, are often justifiable when they meet a labor situation or when they make farm life more attractive and are the means of keeping the boys and girls happy and contented on the farm. In the home, convenience or added attractiveness have, or should have, more weight as deciding factors than money considerations when the purchase of any article is considered.

Applying scientific methods to the home, I fully believe that the art of housekeeping and the mechanical features of homemaking can be worked out to a greater degree of scientific accuracy than the problems relating to the industries or the farm. I am not of course thinking of the hovels where dire poverty prevails, or of the crowded tenement districts, nor am I assuming that landlords will willingly make changes to suit the renting classes. I am thinking rather of those who own their own homes and of the appliances which have to be supplied by those who rent.

By careful planning, both as to the design and location, an attractive, well arranged house can be built in a pleasant, healthful locality, at little or no greater cost than a monstrosity or an eye-sore of the same size situated where the surroundings are mean and unhealthy. It is often possible to improve the appearance of the surroundings of houses and by slight and inexpensive alterations to improve the outside and make the inside attractive and convenient.

In the past in the hill country, the location of a good spring determined where the house should be built, and the evil effects of that once necessary practice remain, often making prohibitive the cost of rebuilding the home and farm buildings in a better location. Now we may choose the best possible location for the new isolated or farm home and bring the water to it.

In urban homes, water, gas, and electricity can be purchased from central stations. In isolated and farm homes, water and electricity may be brought to the houses as cheaply as in the city homes, though at a larger initial expense, and gasoline can be used as a partial substitute for gas.

At the time I consented to write this paper I had not read many of the publications on household conveniences, and I had in mind the discussion of some observations of my own on the heights and arrangements of shelves, sinks and tables and their adaptation to the individual and the work rather than to a standard; the arrangement of shelves and cooking utensils in such a way as to eliminate unnecessary movements; but, when I went to my files of bulletins I found one by Miss Barnett of our own extension school, which covered everything that I had thought of and more besides. I met Miss Oliver, one of the instructors in home economics, and asked her what she knew of scientific management. She blushed and said: "Who told you that I knew anything about scientific management?" I replied that no one had and that I was seeking information. "Well," she answered, "I thought that some one had been talking to you about it," intimating that she had been accused of over-enthusiasm, and then added: "You mean the Taylor system, don't you?" It was a surprise to me that she had studied and was familiar with the Taylor system of scientific

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management. From Miss Oliver I went to Miss Colwell, head of the department, and my surprise was greatly increased to learn how much had been done and how much was being done in our own laboratories and in the model cottage, where a number of girls in this department reside and where theory is put into practice—buying, cooking, sweeping, dusting, elimination of wastes, cost accounting, etc. Even motion study was a part of the laboratory work, though time did not permit any one to become an adept in the laboratory alone; but this defect was at least partly corrected by home practice or practice in the model cottage with a later repetition in the laboratory for criticism.

This is not the place to discuss specific problems, but attention may be called to one difficulty that is a serious bar to progress on the part of the girls as well as to investigators. I refer to the lack of mechanical training. It seems to me that here is work to be done well worthy of being taken up by men possessing mechanical genius. I thoroughly believe that the last word has not been said about the gentle art of washing dishes. Manufacturers like the large electric companies are paying more attention to household conveniences and we may expect much from them. Enough progress has been made to justify the statement that the home problems are being worked out in a scientific way.

The means of training and teaching prospective and active housewives and their help follow the same lines as those for teaching agriculture—the public schools, normal schools, colleges, girls' clubs, the extension schools, institutes, women's clubs, the club agent, free literature, demonstrations by manufacturers of food products, etc. These provisions for self-improvement are not sufficient to introduce generally some of the refinements of the science such as motion study, but on the whole we may expect better results in proportion to the effort expended from teaching home economics than from the teaching of better farm methods.

The chief reasons for this assertion are:

1. That the home conditions can be bettered with a small outlay of capital.

2. That the home processes, while intermittent, are repeated daily or weekly, subject only to slight variations for the menus and the seasons.

3. That the girl returning from school has a better chance to influence the home than has the boy to change farm methods. The West Virginian boy who, having had a thorough agricultural education, remains on the farm, is an exception, whereas the girls stay at home long enough after graduation to put their training into practice, and when they leave it is usually for the purpose of establishing a home for themselves.

On the other hand, in the country districts the women generally have less time for reading than the men and it is more difficult for them to attend extension schools and institutes. In the towns the conditions are reversed.

Unless we are willing to abandon the home as a unit and resort to some sort of community, club or hotel life, where the tasks are assigned to special workers and supervised by specialists, the division of the work being in accordance with the fitness of the individuals for their respective tasks, the principle of cooperation and functional management cannot be fully applied to the home. And yet some of the principles of functional management and division of labor are being applied without sacrificing the home as the unit. I refer more directly to the manufacture and sale of

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prepared foods, ready made clothing, and many other articles formerly made in the home, and to house cleaning by vacuum cleaner establishments. The home is no longer an independently going concern. The grocer grinds the coffee, slices the meat and is ready to supply canned goods and prepared foods of almost every description. Many good housewives know very little about making bread. I am not prepared to say whether the trend toward purchasing of prepared foods is wise or unwise, but there can be no question that the installation of the proper appliances and scientific methods in the home and a proper system of cooperation between the mistress and the maid, where help is employed, will relieve the women of much of the monotonous drudgery of housekeeping and give them time to beautify the home, time for reading and self-improvement, time for social enjoyment and leisure time to enjoy the society of their own immediate families.

I have not tried to pose as a champion of the Taylor system, though I have taken it as a model for comparison. I am aware that critics can find flaws in any system to which the word "scientific" is employed, because of the many variables involved and the impossibility of eliminating the human element. I may say, however, in passing, that if the personal equation is eliminated from science there will be very little science left.

I close with a quotation from Professor D. S. Kimball: "The scientific method that first observes and records the data of the phenomena concerned, then deduces fundamental laws of the phenomena from these data, and lastly applies these deductions to predict other results, has come to stay in all lines of human activity."

THE PRESIDENT. A series of addresses will now be made dealing with "Organization and Administration Under the Smith-Lever Act as Related to the Home Economics Departments and the Farm Home."

Presidents R. A. Pearson of Iowa and A. M. Soule of Georgia, Miss Martha Van Rensselaer of New York, and Miss Virgina P. Moore of Tennessee will lead the discussion.

R. A. PEARSON. I understand that the several papers announced for this subject are supposed to be of equal importance, rather than that the first is the main paper and the others are papers participating in the discussion. With that in mind I have prepared a short statement, with the aid of Dean Mackay of our home economics department, and of Director Bliss of our extension work, in order that I might show you something of what we are doing, not because our way is the best but because I understand it best.

ORGANIZATION AND ADMINISTRATION UNDER THE SMITH-LEVER ACT AS RELATED TO HOME ECONOMICS DEPARTMENTS AND THE FARM HOME

BY R. A. PEARSON

Extension work in home economics at Iowa State College is directed from two offices, each responsible to the president. One is interested in engineering extension and the other, and much the larger, branch is devoted to agricultural and home economics extension, including veterinary work. Through this latter office home economics extension is conducted for the benefit of people both in the country and city.

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A staff of eight home economics experts is employed throughout the year and there are two more experts assisting part time. Besides these there are three young women who assist in demonstrations at short courses for three months. In addition there is one woman county agent, recently appointed. Her official title is "home demonstration agent." One member of the staff, in cooperation with the engineering extension office, gives her entire time to work among girls employed in department stores, shops, and factories in cities. She conducts classes somewhat on this plan: A business concern provides her with space and facilities so that a group of its employees may attend an exercise of one and one-half hours three times per week during working hours and without reduction of pay. These classes continue five weeks, several being conducted simultaneously. Then similar work is undertaken in another city. This is a new kind of effort and is still on trial, but it promises to be successful. This kind of city work is not supported by Smith-Lever funds, but by state and local funds. The latter are contributed by the business interests served and cover all items except the workers's salary, including the expert's traveling expenses and materials for cooking and sewing demonstrations and lessons. The salary of the college representative is paid from state funds. Almost all of the young women taking this work have shown real interest and desire to be taught another year.

All the other home economics extension workers, except the home demonstration agent, are assigned to duties in both country and city. Much of their time is given to one-week short courses in which instruction is offered for five days. Courses are scheduled in different places for each week. These workers are paid about equally from Smith-Lever funds and state funds, the expenses being paid from local funds. On account of this division of salary they are permitted to do work in cities. Care is taken, however, to make sure that they spend a larger portion of their time in the country and in small towns than might be required by the proportion of their salary derived from the federal fund.

PROJECTS

All of our home economics extension work, except that first referred to as being carried on in cooperation with city business firms, is conducted in accordance with the provisions of a project agreement entered into with the States Relations Service of the United States Department of Agriculture. For the sake of simplicity we have made this agreement to cover all the funds used. There is included under the agreement state funds in excess of what must be included in any such agreement in order to secure the federal fund. In actual results the joint agreement provides only for what the State desires to do. Thus the state funds would be used in the same way whether included in the project agreement or not. In other words the views of the United States Department of Agriculture and the Iowa State College have coincided. Thus far there has been but one project relating to home economics extension work. This was suggested by the college and approved by the Federal Department. Obviously it is drawn in general terms so as to include a wide range of work. A special project has been created for the home demonstration agent, for whose support Smith-Lever funds are not used. Some government funds, however, are provided under this project.

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RELATION OF EXTENSION WORK TO THE HOME ECONOMICS DIVISION

Although the extension offices are independent of departments of instruction in the college, a very close relation exists in the appointment and supervision of extension workers. The dean of home economics, at the request of the director of extension, finds persons qualified for appointment and recommends them only when fully satisfied that they are competent. The director of extension reviews information secured by the dean and, if satisfactory, he joins in recommendation of appointment, which goes to the president. This is the recognized procedure, but in practice the different steps are not so well marked because of close cooperation existing between the director and the dean.

The technical work of extension speakers is in accord with that of corresponding college departments. Much importance is attached to conferences between the extension workers and the college staff. These conferences are held in November and in May and cover a period of three to five days. They are mutually helpful. The extension workers secure the latest technical information. For example, the conference with the teacher of dietetics lasts one day and she gives a talk and leads a discussion which are highly instructive to the field workers. On the other hand the extension people bring to the college staff the problems of the State, information as to progress being made, and subjects in which the public is most interested. Through these conferences a unity of thought and action is secured and a better appreciation is developed on the part of each group—college and extension—toward the problems of the other group.

Without doubt the quality of home economics work is being steadily improved. The aim has been always to carry instruction from the college to the people. More and more the instruction is becoming definite and progressive. A short course now begins in a given town just where the last one left off. Five different short courses are offered in home economics work, each but the last intended to lead to another. Thus the people of a community are given a five-year course in five one-week periods a year or more apart. These separate courses are so definitely laid out that different workers may follow one another without danger of omission or duplication.

RELATION TO THE FARM HOME

The work is planned to be of benefit to the farm home. Particular attention is given to modern conveniences for the home and home furnishings. One speaker, to emphasize her point, has given a list of labor saving utensils that could be procured at the cost of a Ford tire—about $15. This list is enough to stimulate the interest of almost any man or woman. Club work receives attention through lessons in pamphlets which club members may study. The usual home economics subjects are given their proper emphasis.

Farm homes are visited on demonstration tours and in connection with short courses, but this work has not been developed to a great extent because of the demand from groups for all the time of the experts that is available.

The Smith-Lever law in our home economics work has been a distinct benefit, because of the additional funds it has provided. There has been

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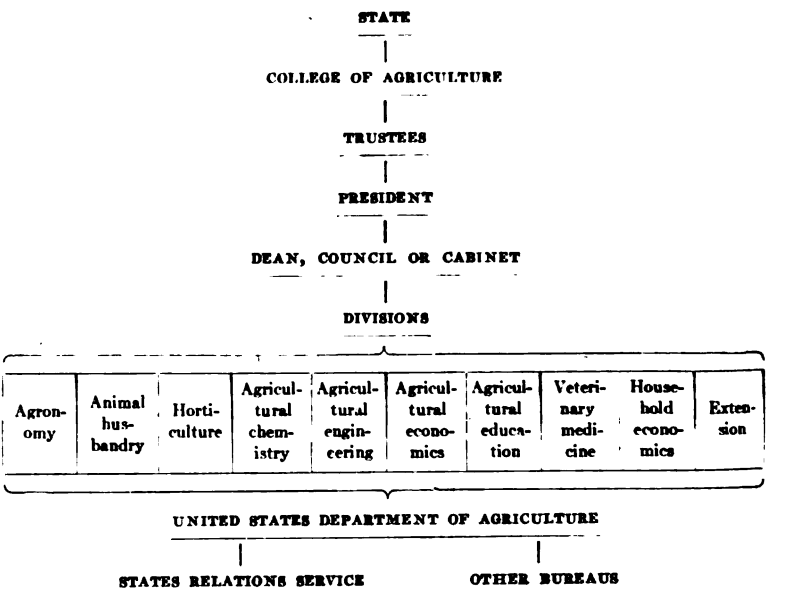
no difficulty in the administration of these funds and acknowledgment is made to the officers in the Federal Department on account of their reasonable and helpful attitude in this connection.

Organization and Administration Under the Smith-Lever Act as Related to the Home Economics Departments and the Farm Home

By. A. M. Soule

Local conditions will play an important part in determining the method of organization and administration which should be followed in coordinating the work of home economics departments with that of the farm home in conformity with the terms of the Smith-Lever Act. In a considerable number of States no provision has been made for coeducation, and hence domestic science departments have not been established in a number of our Agricultural and Mechanical Colleges, whether operated independently or in association with the State University. Coeducation has not been publicly endowed and sanctioned in the case of the institution which I represent, though we look forward with hopeful ambition to the time when this will be accomplished. Under the circumstances I have undertaken to discuss the subject assigned me from the standpoint of what I consider to be an ideal arrangement and in accordance with a plan which would enable us to dovetail the work of a home economics division, as it relates to both subject matter and extension teaching, into that of our present organization.



In this scheme the State, as the sovereign authority, is placed first, the college of agriculture which it has created, second. The institution is governed by its board of trustees, representing the people of the Commonwealth. The president is the executive officer of the trustees and, depending largely on the size of the institution, has associated with him in problems of administration a dean or deans, a council or cabinet con-

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sisting of the heads of the several divisions. In Georgia, the council or cabinet idea has been followed with gratifying results up to the present time. Naturally, a number of the divisions enumerated above have already been established, and such others as are needed will be created as time elapses and funds permit. It will be observed that, according to this plan, the extension division is coordinate in rank with the other divisions, and so its work has become an integral part of that of all the existing divisions.

By this arrangement a thorough correlation of effort has been secured. The whole force and energy of the college and the service of all the individuals employed are placed at the disposal of the extension division. Friction with regard to many matters which might otherwise have arisen has been eliminated, a solidarity of effort and point of view developed, and, comparatively speaking, a high degree of efficiency attained in the case of an initial movement, such as the work of the extension division by reason of its recent origin still constitutes. Through the medium of this plan the extension division has become the funnel through which all the information garnered by the officials of the college may be disseminated in the most cogent manner. Its work has been sufficiently dignified and yet possesses that balanced relation to the original, essential, fundamental research and teaching departments which provides for the largest measure of equilibrium in harmony of thought and continuity of effort in operating the institution as a whole.

In Georgia, provision has been made for carrying into effect an ever-increasing amount of cooperative extension work with the United States Department of Agriculture. The greater portion of it is directly related to the work of the States Relations Service, according to the well-known memorandum of understanding with the Secretary of Agriculture. A good deal of work is also being carried on with various other bureaus of the United States Department of Agriculture, and in all cases an effort has been made to have it so arranged and conducted that it is heartily endorsed by the States Relations Service and the other bureaus concerned. The projects as drawn provide that the chief of the college division primarily interested shall be regarded as the state leader. The advantages of this arrangement are self-evident, since it provides for the close identification and correlation of all the work undertaken with that of the subject matter department to which it pertains. This seems to us to be a distinct advantage and up to the present time has worked very satisfactorily.

COLLEGIATE AND EXTENSION DIVISION RELATIONSHIPS

Household Economics.	*Extension Division.*
Chief—State leader.	Director.
Subject matter.	Administration.
Correspondence.	Projects.
Publications.	Specialists.
Field work.	County agent.
Specialists.	Demonstrator and cooperator.
Projects.	

The manner in which the activities of the several divisions are interrelated to that of the extension division is portrayed above. Conforming to the method of organization followed in Georgia, the chief of the division is the state leader and confers with the director of extension, thus avoid-

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ing friction or misunderstanding. The work is naturally conducted on a project basis, the director being responsible for the general administration, subject only to the approval of the projects by the executive officer of the college and its board of trustees. The state leader is responsible for the subject matter correspondence, publications and the field work of the specialists employed to do extension work exclusively, but associated directly with the division in charge. The state leader and the director prepare the projects in conference with the local state or federal agencies concerned. The division chief selects or nominates the specialist, while the director of extension work relates the activities of the specialist to that of the county agent, the demonstrator and cooperator. This plan has proved desirable, so far as Georgia is concerned, and appears to us to have many obvious advantages which it hardly seems necessary to enumerate in greater detail at this juncture.

ADMINISTRATION: HOME ECONOMICS WORK

Extension Division

Home economics work:	Director. State agent of women. Assistant state agents, women.
Field force:	Specialists. District agents. County agents. Cooperative agencies. Individual family, as unit.

I have pointed out that the Georgia State College of Agriculture has no division of household economics at the present time. I have explained how the work of such a division, if it were in existence, would be correlated with that of the extension division. I come now to a discussion of the administration of home economics work through the extension division as it has actually been conducted since the inception of the movement in 1909. Situated as we are, the director naturally assigned to the state agent and her several assistant state agents the duty of planning, organizing and supervising such home economics work as it appeared could be successfully undertaken. To conduct the work successfully, a field force of specialists had of necessity to be employed. These specialists naturally work through the district agents with the county agents. There must be a number of district agents, because the county agent in the present formative stage of extension teaching in home economics requires the closest possible supervision, and, unless there are a liberal number of competent district agents and specialists, serious mistakes are likely to occur. A district agent should not undertake to do the work of a specialist, as a rule, because of the burdensome character of her supervisory duties. The county agent, by reason of her comparative isolation, must be kept thoroughly posted and informed, for obvious reasons, either by the district agent, or, preferably, a specialist, in order that provision may be made for correct subject-matter teaching and expert advice given about the endless number of questions which the agents is asked to answer. Through the county agent the various cooperative agencies connected with the extension service will be brought into line until the individual family as a unit is ultimately reached.

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Project:
Formulated.
Written.
Activities:
Club organization (girls).
Home and social betterment.
Public service work.

The county agent should confine her efforts to a more or less definite project. With the service still in its initial stage, it seems best that this project be formulated rather than written. From my point of view, it is not possible to write out a definite project for the county agent just at this time which will prove efficient and workable. In the course of a few years, when all the agencies related to home economics work within a given county have been brought into line and the people educated to appreciate a high standard of service, this will no doubt be advisable and desirable; but it does seem to me that too much missionary work must of necessity be done as yet to enable us to do more than formulate the project of the agent. A written project is a fearsome thing to most individuals, and, in many instances, it is doubtful if the county authorities could be induced financially to support an agent whose duties were very much circumscribed, as would likely be the case in a written project. It is also doubtful if an agent attempted strictly to adhere to the terms and provisions of a written project whether she would be able to win the esteem and support for the cause which must of necessity be secured at this stage of its development.

The activities of the agent should, in my opinion, be confined primarily to three lines of effort. First, club organization through the girls. These may be of such a varied character that I shall not attempt to enumerate them, but they constitute a definite and effective means of getting in touch with the community, because the young people are in a receptive frame of mind and they are willing to go in where some of the older angels fear to tread. The second great problem to attack should be that of home and socal betterment. If my observation is worth anything, the home will be most effectively reached through the girls, and once an entrée thereto has been attained, it should not be difficult to establish work of a fundamental character which will not only result in the course of time in the material improvement of the home, but in social betterment as well. The third line of effort would be directed towards what may be termed public service development. This includes all lines of effort leading to the proper recognition and support of home economics activities in a given county, and will be attained by different agents in various ways, but primarily through the ability to meet and deal with the constructive leaders of the county, whether they live in urban or in rural communities.

COUNTY ORGANIZATION HOME ECONOMICS

Cooperative alignments:
State and county boards of education.
Superintendent.
Teachers.
Women's clubs.

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Farmers' organizations
Bankers and philanthropists.
Special agencies.

The cooperative alignments which the extension division in general and its agents should endeavor to establish in a county, should be essentially as follows: First, the work must be related to some definite and well-established agency for which continuity of effort has been provided by law. It seems desirable, therefore, that the aid of the state and county boards of education should be enlisted through the superintendents and teachers. If these forces can be brought into line—and this is certainly practicable—the foundation for a unified and formidable developing effort has been laid. Next, the women's clubs should be asked to lend their aid. As a rule, they are anxious to promote the extension service, because they feel it is a definite movement in which they are essentially interested and which they can afford to support in the most whole-hearted manner. The various farmers' organizations existing in the county should be brought into line. The officials, as a rule, are progressive and liberal and well disposed to the extension movement. There are philanthropists in every community, if the agent can find them and enlist their sympathies. In every county there are various special factors and influences which I need not enumerate, the aid of which should be secured. This can frequently be obtained if they are approached in the right manner. Whenever the support of these several cooperative agencies can be secured, and the county agent possesses desirable personality, a reasonable appreciation of diplomacy, loves her work and discharges her obligations faithfully, excellent progress will be made in that particular county.

MAINTENANCE OF COUNTY AGENTS IN HOME ECONOMICS

College—State Smith-Lever ..... } One-half.
United States Department Agriculture—Federal Smith-Lever }
Local support ..... One-half.
Agents' contracts approved by college and extension officials:
Salary.
Appointment.
Qualifications.
Duties.
Reports.

In Georgia, the following plan has been adopted. The college through its state and federal Smith-Lever or other resources, and the United States Department of Agriculture, through direct or indirect congressional appropriation, provide one-half of the agent's salary. The local community is asked to provide the other half. An effort is always made to secure the money through a representative organization, such as the county board of education, though sometimes the commissioners of roads and revenues make the appropriation, and in a few instances, especially when the work is first started, it has been supported by bankers, boards of trade, women's clubs, or even by individuals. We prefer to have the extension service recognized and supported by an authoritative local force by reason of the greater stability assured. As a rule, we have found the county officials with money at their command willing to appropriate half the funds needed for the maintenance of the agent, and in some instances to exceed the

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funds appropriated by the college and the United States Department of Agriculture. The reason for desiring local support is self-evident. It means a decided increase in the funds available for the employment of agents. It insures greater local interest in the work, and makes the agents feel a larger measure of responsibility and take a more general interest in the welfare of the community which is very desirable. Our experience demonstrates that the best results have invariably followed when the agent has been the recipient of both county and state funds.

With regard to the appointment of agents, contracts for the payment of salaries are drawn at the college and approved by the executive officer and the extension director, and signed by the properly authorized representative of the county. The salary is fixed upon by mutual agreement. The nomination for the position is made by the college through its extension division and confirmed by the States Relations Service. The selection and qualifications of agents are thus passed upon by competent persons and the appointment not left to the caprice of the community. The duties of agents are jointly outlined by the college through its extension division and the States Relations Service, and weekly reports are made in compliance with the regulations of the offices concerned. The agent is directly responsible to the extension division and her contract can be terminated in thirty days if it should prove desirable to make a change. Thus, the question of local aid has not been permitted to interfere with the selection or appointment of agents, nor has their responsiblity to the central office been changed or minimized thereby. In fact, up to the present time the great majority of counties have voluntarily asked that an agent from outside the county be sent to them, and they have requested that persons expertly trained be selected. Unfortunately, the discovery of a sufficient number of agents with that indescribable personality and that many-sided training which would enable them to discharge the duties of such a position in the most acceptable manner, has been a difficult and at times a discouraging task.

RESULTS OF PLAN

1. Club organizations through schools.
   - Formation parent-teachers clubs.
   - Monthly meetings.
     - a. Winter.
     - b. Summer.
   - Correlation school and club work and home and school work by committees.
   - Education—school library.
   - Sanitation—sanitary water supply.
   - Recreation—play grounds.
   - Beautification—flower beds, etc.

Result:

- 4,200 girls enrolled.
- Five-H brand developed:
  - Head, hand, heart, health and home.
- Fairs, contests and scholarships.
- School a social center.

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2. Home and social betterment.
   Adults and homes reached through girls.
   Community clubs.
   Suggestive programs.
   Flies.
   Fireless cooker.
   Personal hygiene.
   Milk production.
   Butter making.
   Curing meat.
   Result:
   Cooperation of parents.
   Publicity.
   Speeches by leaders.
   Recreation (humor).
   The five-cent lunch.
3. Public service work.
   The rest-room kitchen.
   Result:
   Sympathy of urban community.
   Preachers.
   Publicity.
   Georgia-products dinner.
   Parades, etc.

Following out the plan of organization outlined, it has been possible to accomplish work of the character indicated above in a very considerable number of counties where home economics agents have been employed. You will understand from the preceding statement that the agent has not gone into the county without having some cooperation and support from various essential and all-important local forces. By reason of the coordination of the club work with that of the schools, the first effort has been made to reach the girls through the schools. The next step has been the formation of parent-teachers clubs which hold monthly meetings. In the winter or during the school term they are held at the school; in the summer, at the homes of the girls. Through this arrangement, the school and the club and the home and the school have been correlated.

In each school four committees have been formed and the parents have been included therein as well. These committees are: first, education; second, sanitation; third, recreation; and fourth, beautification. Thus, through the organized action of the children, a library has been started in a great many of the schools and the girls' minds directed towards the reading of literature dealing with home economics and social problems. Through the efforts of the committee on sanitation, the condition of the buildings has been improved and a sanitary water supply provided. Through the committee on recreation, the play grounds have been cleaned up and made available for various sports with most beneficial results. Through the committee on beautification, the school grounds have been decorated with trees, shrubs and flower beds. Thus, the whole point of view of these girls has been changed and that of their parents as well, because all have been brought together in a cooperative effort to improve the school and make it a social center, and this has naturally reacted on the homes in a helpful manner.

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Our 50 county agents in domestic science enrolled last year 4,200 girls in their canning clubs. These girls were taught to put up the Five-H brand of canned goods, which stands for the development of the head, hand, heart, health and home. I would like to add a sixth letter standing for happiness. At first this was known as the Four-H brand and it immediately became so popular that a specific demand sprang up for the goods bearing this label. This will indicate to you how effectively the teaching of one simple but definite thing to 4,200 girls, namely, the canning of fruits and vegetables, has taken hold of the people of a Commonwealth.

Consequent upon the formation of clubs in Georgia a few years ago, many counties and hundreds of schools now have an annual fair and contest at which numerous prizes are given. A number of scholarships are also awarded to the short courses held annually at the State College of Agriculture. Thus the school has been made a social center and the whole outlook on life of some thousands of girls changed, their point of view made definite, their lives constructive, and their vision of the future and what it may hold for them through the benign influence of education amplified in a manner which baffles adequate description.

Through the home and social betterment effort of the agents, the adults in the homes have been reached directly in some considerable measure, but primarily through the organization of the girls into canning clubs. Wherever the housewives have become sufficiently interested, community clubs have been formed which meet monthly, and to these gatherings the men have been invited. On these occasions suggestive talks and demonstrations have been made, thereby enabling the agent to arouse the self-interest of the community. For instance, one of these gatherings devoted its energies to a study of the house fly and methods for its control and eradication. The importance of this need not be emphasized. The subject of the fireless cooker with demonstrations constituted another program. Personal hygiene has been discussed in many localities, the leader being an eminent physician and therefore capable of commanding the respect of his hearers. Milk production, butter making and the curing of meat have all been stressed to the greatest possible advantage. Thus, the formation of these community clubs has been made the basis of reaching the home, providing in some measure for the dissemination of a vast amount of the most important information in a happy and effective manner, and for the recreation so essential to the welfare of hundreds of people living in the open country and who are literally drying up because they lack distraction, entertainment and the wholesome benefits which flow from the cultivation and expression of humor.

Under the head of public service undertakings, rest rooms and kitchens have been established in some of our larger towns. In other words, besides providing suitable rest rooms, a kitchen with all modern facilities and attachments has also been developed, thereby enabling the women who come in from the country not only to obtain rest but information as well. As a rule, demonstrations are held in these kitchens on Saturdays. The kitchen, of course, has been furnished by the local merchants and demonstrations are made from time to time by the agent, and other competent and disinterested persons. One agent, for example, interested a trained nurse who gave a series of lessons on cooking for sick people and invalids to a group of rural mothers who were glad to acquire such helpful information. By this plan the sympathies of the urban and rural communi-

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ties have been cemented together, the interest of the preachers, who are a force in every part of the country, secured, a desirable degree of publicity obtained, and the extension service brought to the attention of the public in a forceful manner by the preparation through the club members of what we term locally a Georgia-products dinner.

ONE AGENT'S RECORD, 1916

1. Club organization.
   - Girls enrolled—garden and canning 60
   - Vegetables canned ..... 41,265 pounds
   - Value of club garden products $675.25
   - Profit per one-tenth acre garden $25.75
   - Record report $96.50
   - Girls making caps and aprons 50
   - Canning and cooking demonstrations 150
   - Number winter gardens 12
2. Home and social betterment.
   - Women demonstrators 50
   - Parent-teachers clubs 12
   - Attendance at 144 meetings 12,800
   - Vacation meetings in homes.

   Results:
   - Fireless cookers 59
   - Wheeled trays 10
   - Fly traps 25
   - Ironing boards 8
   - Kitchen cabinets 12
   - Shower baths 7
   - Butter made by demonstrators ..... 7,000 pounds (Price doubled from 20 to 40 cents).
   - Poultry maintained ..... increased 50 percent
   - Preserving demonstrations 50
   - Demonstrations by agents 150
   - Dairy demonstrations 14
   - Poultry—spraying, egg testing 10
   - Gardening, hot beds, etc. 8
   - Cooking, lunches, etc. 80
   - Bulletins distributed 2,500
   - Miles traveled 5,980
3. Public service work.

   Organization:
   - Rest room.
   - Model kitchen.
   - Preparedness.
   - Model dairy.

   Cooperation:
   - Ministers.
   - Public officials.
   - People generally.

The practical application of a theory is always a matter of interest; and to this end the effort of one agent for about ten months of the year 1916

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is presented as information. Notice that her achievements have been summarized under the three heads of club organization, home and social betterment and public service work. Let us consider for a moment what the 60 girls enrolled by this agent in the various clubs accomplished. Observe that they canned 41,265 pounds of vegetables valued at $675.25, the average profit from their one-tenth acre gardens being $25.75. Who can measure the value of the service work performed in this community? Who can correctly estimate the effect of these demonstrations on the lives of these girls or the community in which they reside? They have been taught a new industry and have been shown what the land is capable of producing under wise management. They possess some appreciation at least of the elementary principles of plant growth and development. They have learned in a measure the value of money, the possibilities of earning it, and the power of their latent energies when capitalized by education. Not only were these girls taught to can, but they made caps and aprons and so were familiarized with the elementary principles of sewing. In addition, the agent conducted 150 canning and cooking demonstrations with them and succeeded in having 12 winter gardens started in connection with the schools. This certainly constitutes an instructive record and has undoubtedly set in motion forces which will exert a cumulative effect on this county's welfare and prosperity for many years to come.

Under the head of home and social betterment, this agent had 50 women demonstrators and organized 12 parent-teachers clubs which held 144 meetings during the year, attended by 12,800 persons. As a resultant of these meetings and demonstrations, 50 fireless cookers, 10 wheel trays, 25 fly traps, 8 ironing boards, 12 kitchen cabinets and 7 shower baths were installed in the homes of the various members. Seven thousand pounds of butter were made and the quality so improved that the price was raised from 20 to 40 cents a pound. The number and quality of the poultry maintained on the farms from which these women demonstrators came increased by 50 percent. To effect these changes the agent made 150 general demonstrations, 50 preserving demonstrations, 14 dairy demonstrations, 10 poultry, spraying and egg-testing demonstrations, 8 garden and hot-bed demonstrations, and 80 school lunch cooking demonstrations. She also distributed 2,500 bulletins and traveled approximately 6,000 miles. She induced the merchants of the chief city in the county to establish a rest room and model kitchen, conducted a preparedness parade, started a model dairy, and won the cooperation of the ministers, public officials and people generally.

It seems to me that this good woman has accomplished results which justify my faith in the plan of organizing an extension division which we have followed in the Georgia State College of Agriculture. No doubt our scheme will need to be modified from time to time as the work progresses, but it seems well designed to meet the exigencies of the present situation, and I feel will enable us to reach an ever-increasing number of girls and women, bringing within their grasp the fundamental knowledge essential to the ordering of their lives and homes along the most constructive and efficient lines. If this can be done, as now seems feasible, the Smith-Lever Act will have served the purpose for which it was designed in so far as it relates to home and social betterment.

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Miss Martha Van Rensselaer of New York. The nature and scope of the subject matter of home economics gives it a coordinate place with the subject matter of agriculture. It is not a sub-division of agriculture in the same sense as are poultry husbandry, dairy industry and soils. Home economics arises from the needs of all the people and relates to the work of the home in its physical care of all persons and its inspiration of ideals of citizenship. Home economics finds its place readily in a college of agriculture because it takes up the subject where agriculture leaves off. Agriculture is concerned with production and distribution; home economics is concerned with consumption. The success of agriculture is partly dependent upon consumption and distribution; home economics is much concerned with production and distribution.

Governments are interested in these large factors of success and appropriations are made to extend education in agriculture and home economics. Naturally the business of farming has been developed faster than the business of homemaking, although efficiency in the business of farming depends largely upon efficient housekeeping.

The extension of home economics brings up problems which agricultural subjects do not, because of the difference in preparation of workers and the difference in audience. Appropriations made for extension of these subjects, if in a college of agriculture, are administered by a director of extension, who may or may not be the dean of the college. It is well to avoid duplication of effort and administrative matters as they concern the business side of all the work, naturally fall into one office. At the point of subject matter, however, there naturally lies a division of responsibility, because the director of extension is a man trained in agriculture and not in home economics. As regards subject matter, it seems desirable to give a coordinate and at the same time a cooperative standing to home economics extension enterprises. The machinery for extension of both subjects may be in the same office, but the organization of subject matter and plans for reaching the homes should lie in the subject matter department. By this plan we should have a director of extension whose function is business administration for the whole and the extension of agricultural subject matter, and another person who is responsible for plans and subject matter in home economics. This person should be the head of the department of home economics or a member of the department enjoying the same academic privileges as resident instructors.

Home economics, having as broad a field from which to extend as agriculture, needs specialists, as in agriculture, who should have the same relation to the department as resident specialists. Nothing short of time spent each year in home economics laboratories as a source of material will give the same value to extension teaching as to college teaching. The extension worker in home economics should have similar qualifications as the college instructor, with other necessary qualifications to fit her for this piece of work. If the extension worker is divorced from the department, she is not in a position to extend the work of the department. There should not be in one college two sources of the same subject matter. When the Smith-Lever money became available under which extension projects might be worked out for homemaking as well as for agriculture, it necessitated a study of methods to place the subject matter as developed in the colleges upon an educational basis, and the first problem was one of organization and method rather than content of subject matter. The next development

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is one of making the subject matter of home economics fit the needs of the people. Instructors in education have applied principles to the teaching of home economics as well as to agriculture. A good department of home economics should not be without such assistance. In the meantime, research and organization of subject matter has proceeded in various institutions of the country. The extension worker should be connected with this organization.

It has been said that home economics has nothing to extend. A large body of fact has been worked out by men and women which relates to foods and nutrition, health, housing, clothing and social home welfare, which can only be successfully extended by specialists. The selection of untrained women for this work has led to the comment of lack of material. Better to say that some extension workers have nothing to extend than to say that well founded departments of home economics have nothing to extend. Neither should the amount of subject matter to be extended be judged by those who have specialized in other lines. Subject matter in home economics should meet the needs of the people. The extension worker should connect those needs with the source of material. A department of home economics needs such vitalization and is much stronger for having work in extension.

Home economics is not confined to woman's work. It is related to right living in which men and women are both concerned. Subject matter for such up-building may be given by a man or by a woman according to preparation and experience. Much of the subject matter embraced in home economics has its origin in research conducted by men and may be extended by men if more practical to be so. Cooperation should be had with departments of the college which are doing parallel work which may be useful in the home, such as rural engineering, rural art, dairy and poultry husbandry. Home economic workers apply such subject matter to home life or the teaching may be given direct by those who are formulating such knowledge.

Administration and organization in connection with extension projects should be conducted in a way to avoid duplication of effort and expense. The worker in each division, agriculture and home economics, is helpless in directing the subject matter of the other, but the office of administration established by agriculture may well be the center of administrative work. Ultimately there is a common interest, for men and women in both fields are continually working together on those projects related to the farm and home and the upbuilding of a better rural community.

Organization and Administration Under the Smith-Lever Act, of the Department of Home Economics, Division of Extension, College of Agriculture, University of Tennessee and its Relation to the Farm Homes of Tennessee

By Miss Virginia P. Moore

Since the passage of the Smith-Lever Act, demonstration work for the women in the farm homes of Tennessee has been put on a permanent basis. The home demonstration branch is a vital department in the division of extension of the University of Tennessee. This work is in the immediate charge of the director of extension and the assistant director in home demonstration. These in turn are assisted in the administration of

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the various lines of work by three district agents, one for each of the following geographic divisions: East Tennessee comprising 34 counties, Middle Tennessee 41 counties, and West Tennessee 21 counties. There are, in addition, two district supervisors (colored) who assist in the supervision of the work for negroes. The various lines of work are planned and developed under the direction of the administrative officers, by specialists in home economics and in health. The men specialists of the division, of whom there are 12, are at all times ready and willing to assist in our work. There are 32 county agents in home demonstration work, who are employed from 8 to 12 months.

The home demonstration work is the direct outgrowth of the canning club work for girls, which had been in existence in Tennessee two years before the passage of the Smith-Lever Act. With the increase of funds, the work with the girls has expanded, and, step by step, the work for women is being done in a very definite way. Our most successful work is developed on the demonstration plan in counties where there are county agents, although urgent demands are met in counties where there are no local representatives of the division. Movable schools are conducted in many of the latter. For example, the home demonstration department directs and assists the homemakers' departments of the three sectional farmers' institutes in Tennessee. There are more than 2,000 women enrolled in these organizations. The more successful home demonstration clubs are in the counties where the girls' club work has been previously developed.

The home demonstration clubs are organized both on the community and on the individual plan. The method used is to call the women of the community together into an organization for home and community betterment. Possibly from 6 to 20 members will consent to act along a specific line as demonstrators in their respective homes. It may be a demonstration of the continuous garden; the saving of the surplus of fruits and vegetables by the best canning methods; the raising of poultry according to approved methods; the improvement and the increase of the supply of milk and butter in the farm home; the emphasizing of health problems; and of proper food, clothing, shelter, etc.

The exchange of experience is most valuable where there are several in a home demonstration club at work on different problems. Women often ask to be enrolled as demonstrators in two or more lines of work. These women are unconsciously acting as teachers for the whole community. "Getting together" is most valuable. Many isolated women who are met in their homes by the county agent, are helped along specific lines by the individual aid plan. The women learn how to develop and improve the existing methods in household management so as to economize in time, labor and money. Special emphasis is being given to home conveniences. Home demonstration members often assist in developing the life of the community by taking a more active interest in girls' clubs, in recreation, in cooperative associations, and in school and religious activities of the community.

The county agents usually organize the county under the direction of the district agent and with the advice of county superintendent of schools into 10 to 30 club centers the number depending largely upon local conditions. Club meetings are held once or twice a month, either in some home or at the schoolhouse. The county agent endeavors to be with each club at least once a month.

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The home demonstration department of the division of extension sends out bi-monthly programs for the girls' and women's work and bulletins on specific lines of work.

A FEW CONCRETE EXAMPLES OF WHAT DEMONSTRATION WORK HAS ACCOMPLISHED IN TENNESSEE

Mary Harris, freckled-faced, cross-eyed and very timid, developed within two years so that she has won sweepstakes at two fairs, was local chairman of the canning demonstrations at the district fair and girls' teams directed by her gave successful canning demonstrations.

Self-confidence, the result of successful work, has made Mary look one "straight in the face." She is now a capable, good looking girl. Her enthusiasm is contagious and her development a source of great satisfaction to the county agent, who has worked patiently with her. Her record for 1915-16 follows:

	1915	1916
Pounds of tomatoes	3,417	2,071
Pounds of other products		4,270
Cans of tomatoes	410	18
Cans of other products	1,826	955
Total number of cans	2,236	973
Value of vegetables sold	$ 4.40	$102.40
Total receipts	228.49	434.60
Expenses deducted	17.79	74.84
Net profit	210.70	359.56

In one county ten centers have been organized for the rural women; regular meetings are held every two weeks. Women, who heretofore left home but once or twice a year, now put on their best bib and tucker and attend these meetings. All meetings are planned not to interfere with household duties. A marked difference in the personal appearance and a more cheerful and happier expression is noticed.

It is gratifying to note that the farmer's attitude toward the women of his family is undergoing a change. A decided tendency is observed to provide for them better home conveniences with a resulting better understanding between all members of the family.

Matrimony has claimed a number of the first club girls. It is gratifying to note that they are making an impression upon the communities where their new homes are located.

Several of the first year girls are in college now, preparing to make rural workers. They have earned enough money wherewith to provide for their education, largely through club activities.

Several mortgages have been lifted from homes through the efforts of the club girls.

Eleven homes in Montgomery County have installed waterworks. This was done under the direction of the county home demonstration agent.

Mrs. Campbell says that she cannot express in words what the home demonstration work has been to them. However, this is the effort she made: "It has made us think; it has made us study subjects pertaining to the home from a scientific standpoint; we see bread-making and cooking of meats and vegetables in a new light. Our mental visions have been broadened. We have been brought into a closer relation with the experi-

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ment station, the farmers' institute, the University of Tennessee and the Department of Agriculture at Washington."

T. D. Boyd of Louisiana. It seems to me unfortunate that two great associations, the National Association of State Universities, and this body, should meet at a time when large questions affecting the interests of their constituent colleges are being discussed in Congress, without coming to some agreement with regard to these measures; and yet that no such agreement has been found is evident from the divergent resolutions passed by the two Associations yesterday and the day before. Their Executive Committees should get together and agree upon some common ground on which all may unite. We should give our Executive Committee some specific thing to do and should require it to take up the matter with the committee representing the State Universities. Should we not, moreover, take advantage of the fact that President Wilson is a man who has made a lifelong study of educational problems, and who, if we may judge the future by the past, will have some influence in shaping legislation in this present Congress on matters in which he takes a deep interest?

On these accounts, I have prepared a resolution covering these points for reference to the Executive Committee. It reads as follows:

"*Whereas*, several bills extending the aid of the Federal Government to education in the States are now pending in Congress, and other measures of similar purport are being discussed or proposed; and

Whereas, the present President of the United States is deeply and specially interested in education; therefore

Be it Resolved, That the Executive Committee of the Association of American Agricultural Colleges and Experiment Stations is hereby instructed to seek an audience with the President before the next session of Congress, to lay before him the opinions and desires of this Association regarding said congressional legislation, and in particular to stress the conviction that in the educational relations of the Federal Government with the several States there should be no radical departure from the methods that have been found satisfactory in carrying out the provisions of the Federal Land-Grant Act of 1862 and the subsequent acts supplementary thereto.

Be it Further Resolved, That the Executive Committee of the National Association of State Universities be invited to join the Executive Committee of this Association in the proposed conference with the President.

Be it Further Resolved, That the two Executive Committees, or their chairmen, are hereby instructed (as to one committee) and requested (as to the other) to appear before the Senate and House committees to which these bills have been referred and make such presentation of the views of the two Associations as they may deem wise and expedient."

The resolution was referred to the Executive Committee.

The President. The report of the joint committee on projects and correlation of research will be presented by its chairman on the part of this Association, Dean F. B. Mumford of Missouri.

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Report of Joint Standing Committee on Projects and Correlation of Research

The joint standing committee on projects and correlation of research was appointed for the purpose of studying the research projects now active in the Federal Department of Agriculture and in the State Experiment Stations. It seeks:

1. To determine if there now exists any wasteful, unnecessary or perhaps harmful duplication of effort within these agencies.

2. To recommend general principles which may be applied at this time, to the end that public funds may be more efficiently and economically utilized.

3. To suggest definite opportunities for the correlation of investigative projects, planned with a view of solving the same or similar problems.

4. To determine the facts, to interpret the results, and to make recommendations, in order that greater efficiency may be obtained; in some cases by hastening the completion of important work and in others by securing the advantages which may be derived by a combined attack on the same problem at the same time at several locations.

The committee has undertaken to make as careful and complete a survey as may be of existing research projects in the State Stations and the Federal Department. This survey has not been completed. Every station director has been asked to file a list of the projects now active in his station, and two-thirds of them have supplied this information. The printed program of work published by the Federal Department indicates the nature and scope of its research projects. The committee now has on file a list of about 1,200 investigative projects located in the stations and about 750 in the Federal Department. No final generalizations as to the extent of duplication can now be made. However, the information already available justifies the statement that duplication is frequent and that in part it may be avoided by voluntary cooperation through conference of investigators.

The committee believes that if the information now in hand touching station projects were made available in some such way as is done by the Federal Department in connection with its published program of work, a most valuable means would be afforded of bringing about cooperation of effort and greater efficiency and economy would be secured. It hopes to present at the next convention of this Association a reasonably complete list of the active research projects of the several stations similar to the previously mentioned departmental list.

W. A. Taylor,
J. G. Mohler,
Milton Whitney,
W. R. Dodson,
Jacob G. Lipman,
F. B. Mumford.

On motion, the report of the joint committee on projects and correlation of research was received.

The President. I will ask Messrs. A. M. Peter and Geo. Roberts of Kentucky, and H. A. Morgan of Tennessee to report a suitable minute concerning the recent death of Director J. H. Kastle of Kentucky.

On motion, a recess was taken until 9 A. M., Friday, November 17.

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MORNING SESSION, FRIDAY, NOVEMBER 17, 1916

The Convention was called to order at 9 A. M. by President Thorne.

THE PRESIDENT. The report of the committee on extension organization and policy will be presented by its chairman, Director C. W. Pugsley.

REPORT OF COMMITTEE ON EXTENSION ORGANIZATION AND POLICY

During the winter and early spring of 1916 the chairman of your committee received a number of letters from extension directors suggesting matters which should be taken up in conference with the Executive Committee and representatives of the States Relations Service. These matters dealt largely with the relations existing between the United States Department of Agriculture and the State Colleges of Agriculture.

It was suggested by several directors that the chairman of your committee should secure an expression of opinion from the agricultural colleges concerning the working of the memorandum of understanding between the United States Department of Agriculture and the various State Colleges, submitted June, 1914, in order that these expressions might supply to the committee exact knowledge as to the will of the colleges as based upon their experiences since the memorandum of understanding went into effect.

Accordingly letters were sent to all the extension directors and to all presidents and deans of agricultural colleges. Forty-three replies were received from 37 States. A tabulation of these replies showed that while 15 of the States reported that the relations were satisfactory in all respects, 26 made more or less serious complaints concerning the existing methods of cooperation.

The questionnaire sent to the directors of extension and college executives read as follows:

1. Has the general memorandum of understanding between the College and the Secretary of Agriculture been carried out in your State?

2. Is the cooperative relation existing between the Department and the extension service of the College perfectly satisfactory to your State?

If not, in what way was it is unsatisfactory?

3. If there have been any violations of agreements, or any unsatisfactory occurrences, will you please specifically itemize them.

4. Has the handling of Smith-Lever funds and department funds used for extension work in your State been entirely satisfactory?

If not, give specific instances.

5. Is the method of project work now in vogue between the Department and the State perfectly agreeable in every way, and have the projects been adhered to?

If not, give specific instances.

6. Have any people from the United States Department of Agriculture done extension work in your State without consulting the college authorities and without taking the matter up through the extension service of the College and the States Relations Service of the United States Department of Agriculture?

If so, please give specific instances.

The replies were carefully gone over by the committee and excerpts from them presented to the Executive Committee. In these replies 30

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specific instances of violations of the existing memorandum of understanding were given.

It might be well in considering the matters brought before the committee to quote the general memorandum of understanding which has been signed by the presidents of most of the Agricultural Colleges and by the Secretary of Agriculture.

MEMORANDUM OF UNDERSTANDING

BETWEEN THE

.....

AND THE

UNITED STATES DEPARTMENT OF AGRICULTURE

REGARDING EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

IN THE STATE OF .....

Whereas, ... has, or may hereafter have, under its control federal and state funds for extension work in agriculture and home economics, which are and may be supplemented by funds contributed for similar purposes by counties and other organizations and by individuals within said State, and the United States Department of Agriculture has, or may hereafter have, funds appropriated directly to it by Congress which can be spent for demonstration and other forms of extension work in the State of .....

Therefore, with a view to securing economy and efficiency in the conduct of extension work in the State of ....., the President of the ....., acting subject to the approval of the Board of ..... of said ..... and the Secretary of Agriculture of the United States, hereby make the following memorandum of understanding with reference to cooperative relations between said ..... and the United States Department of Agriculture for the organization and conduct of extension work in agriculture and home economics in the State of .....

I. The ..... agrees:

(*a*) To organize and maintain a definite and distinct administrative division for the management and conduct of extension work in agriculture and home economics, with a responsible leader selected by the ..... and satisfactory to the Department of Agriculture:

(*b*) To administer through such extension division thus organized any and all funds it has or may hereafter receive for such work from appropriations made by Congress or the State Legislature, by allotment from its Board of ..... or from any other source;

(*c*) To cooperate with the United States Department of Agriculture in all extension work in agriculture and home economics which said Department is or shall be authorized by Congress to conduct in the State of .....

II. The United States Department of Agriculture agrees:

(*a*) To establish and maintain in the Department of Agriculture a states relations committee, pending the authorization by Congress of a States Relations Service, which shall represent the Department in the general supervision of all cooperative extension work in agriculture and home economics in which the Department shall participate in the State of ..... and shall have charge of the department's business connected

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with the administration of all funds provided to the States under the Smith-Lever Act.

(*b*) To conduct in cooperation with ..... all demonstration and other forms of extension work in agriculture and home economics which the Department is authorized by Congress to conduct in the State of .....

III. The ..... and the United States Department of Agriculture mutually agree:

(*a*) That, subject to the approval of the President of ..... and the Secretary of Agriculture, or their duly appointed representatives, the cooperative extension work in agriculture and home economics in the State of ..... involving the use of direct Congressional appropriations to the Department of Agriculture shall be planned under the joint supervision of the Director of Extension Work of ..... and the Agriculturist in charge of Demonstration Work of the United States Department of Agriculture in the North and West[1]; and that the approved plans for such cooperative extension work in the State of ..... shall be executed through the extension division of the ..... in accordance with the terms of the individual project agreements;

(*b*) That all agents appointed for cooperative extension work in agriculture and home economics in the State of ..... under this memorandum and subsequent project agreements, involving the use of direct Congressional appropriations to the Department of Agriculture, shall be joint representatives of the ..... and the United States Department of Agriculture, unless otherwise expressly provided in the project agreements; and the cooperation shall be plainly set forth in all publications or other printed matter issued and used in connection with said cooperative extension work by either ..... or the United States Department of Agriculture;

(*c*) That the plans for the use of the Smith-Lever fund, except so far as this fund is employed in cooperative projects involving the use of department funds, shall be made by the extension division of the ..... but shall be subject to the approval of the Secretary of Agriculture in accordance with the terms of the Smith-Lever Act, and when so approved shall be executed by the extension division of said .....

(*d*) That the headquarters of the state organization contemplated in this memorandum shall be at .....

IV. This memorandum shall take effect when it is approved by the President of ..... and the Secretary of Agriculture of the United States and shall remain in force until it is expressly abrogated in writing by either one of the signers or his successor in office.

.....

Date..... Pres. ———— Col. of Agr.

.....

Date..... Secretary of Agriculture.

A meeting of the committee on extension organization and policy was held at Amherst, Mass., July 11, 1916, and decisions then reached brought

[1] Or South (in 15 states).

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to the attention of the Executive Committee. It was agreed that the matter should be presented for discussion on the following day at a joint meeting of the Executive Committee, the committee on extension organization and policy, and representatives of the States Relations Service. The following statement is the record of the conference, and represents the deliberate agreement of those present, namely:

W. O. Thompson of Ohio; W. H. Jordan of New York; H. L. Russell of Wisconsin; Brown Ayres of Tennessee; H. J. Waters of Kansas; representing the Executive Committee.

C. W. Pugsley of Nebraska; W. R. Dodson of Louisiana; H. L. Russell of Wisconsin; Alva Agee of New Jersey; W. D. Hurd of Massachusetts; representing the committee on extension organization and policy.

A. C. True, C. B. Smith, and Bradford Knapp, of the States Relations Service; representing the Department of Agriculture.

A very full, free and frank discussion of the whole situation developed as a result of the questionnaire (p. 3). The following statement accurately sets forth the understanding reached during this conference:

1. *Direct communication.* It was agreed that all work within the States should be done through the directors of extension and that there should be no communication between the States Relations Service and the workers within the States except as delegated by the directors; that, in brief, the principle of dealing directly with and through the extension directors enunciated in the general memorandum of understanding of 1914 should be adhered to.

2. *Educational work organized through colleges.* It was agreed that an effort should be made to differentiate between the educational and regulatory work as carried on by the United States Department of Agriculture (the hog cholera work was especially mentioned as an example in question); and that the educational work should be organized through the college and it should be recognized that the cooperation of other agencies, such as state boards of agriculture or live stock sanitary boards, is necessary to the successful prosecution of the work.

3. *Representations to the Secretary of Agriculture.* It was agreed that the Executive Committee, acting in conjunction with the States Relations Service, should present to the Secretary of Agriculture matters which seem to be outside the power or jurisdiction of the States Relations Service and the extension committee of the Association.

4. *Appointment of specialists.* It was agreed that the States Relations Service should not appoint specialists in subject matter for use among the people of the States, except as they are to work with the directors of the extension service.

It may be said, parenthetically, that this does not mean that the Federal Department may not employ and use specialists, but that it was the general consensus of opinion that it was undesirable for the States Relations Service to send out specialists unless they were to work in conjunction with the extension services. The opinion was also expressed that if money was available to hire specialists their efforts would be likely to be more effective if the funds were made available for use directly through the local institutions.

5. *Conferences.* It was agreed, touching the matter of national and district conferences of extension workers, that in the future all such con-

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ferences should be called jointly by the States Relations Service and the committee on extension organization and policy of this Association, and that programs should be made jointly by these two parties or their representatives.

6. *Contingent fund.* It was agreed that a contingent fund of approximately five percent, if requested, should be allowed in the allotment of Smith-Lever funds, said contingent fund not to exceed $5,000 in any case.

It may be said further, by way of parenthesis, that it is impossible for any extension director to predict the future; and that if funds are all allotted at the beginning of the year and some unforeseen contingency arises necessitating special work, no funds are available. Hence it was thought important that a contingent fund should be allowed.

7. *Uniform system of allotment, etc.* It was agreed that as rapidly as possible the policy of the Department in allotting cooperative demonstration funds and in conducting extension work should be to adopt a uniform system applicable to the various states.

8. *Vacations.* It was suggested, touching the matter of vacations for men cooperatively employed, that salary adjustments be made in such a way as to allow extension workers who are cooperatively employed a reasonable vacation and on a uniform basis with other members of the extension staff in the various States.

Parenthetically once more it may be said that under the existing law the Federal Department cannot permit an extension worker to take more than two weeks' vacation if he receives his pay even in small part from federal funds other than Smith-Lever funds. The only feasible method of adjustment seems to be to have that portion of the pay which is derived from federal sources, cover, say, 10 or 11 months' time, and then have the portion which is derived from the college cover the other month or months. The worker may then take his vacation during the months when he is receiving pay solely from college funds. This arrangement does not involve the payment of more money by the college, but simply an adjustment of the funds received from the two sources to meet this special situation. In no other way can an adequate vacation period be secured.

9. *Financial reports.* It was agreed that while it was very desirable as a matter of information useful to the public that all States should report fully on all phases of their extension work and as to the usage of all funds, the States Relations Service did not desire that, in making the reports called for by the terms of the Smith-Lever Act, the extension executives should consider themselves legally bound to report on all extension work or on all expenditures made for extension work.

Thus, for example, there is no necessity of reporting the funds provided by a State in excess of the amount needed to offset Smith-Lever appropriations, although such reports seem advisable.

10. *Direct submission of reports.* It was agreed that all reports of extension workers should be submitted to the extension directors, and that they should send such copies or excerpts to the States Relations Service as might be necessary under the law or agreed to by the parties concerned.

11. *Immediate operation.* It was agreed that the States Relations Service and the State Extension Services should put into operation as rapidly as possible the matters contained in this report.

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Your committee feels certain that strict observance of the matters agreed to at this conference by the State Colleges and the United States Department of Agriculture will result in greater efficiency in extension work, and it urges that every extension service use as a basis of its work the agreements reached at this conference.

Your committee wishes further to call to the attention of the several colleges of agriculture the last paragraph of its report of last year (Twenty-Ninth Proceedings, p. 129), reading as follows:

"Inasmuch as instances have been reported to this committee where the cooperative relationship set forth in the general memorandum of understanding existing between the States Relations Service representing the United States Department of Agriculture and the several State Colleges do not seem to have been adhered to in spirit, the committee suggests that extension directors and other college officers report to the Executive Committee of this Association, or to some other central body to be designated by the Association, any data which may bear on this matter in order that complaints or misunderstanding may be promptly and effectively dealt with and the general policy maintained."

It was brought to the attention of the committee that the work of the representatives of the States Relations Service at times was made very difficult by the attitude and acts of officers of the Colleges of Agriculture and of their representatives in the extension field. In other words, the trouble is not entirely a one-sided one. Extension directors, in the language of the prayer book, are "miserable sinners" as well as are the federal officials. For example, we have asked and it has been agreed to in this conference that all correspondence be carried on with the extension directors, so that "short-circuiting" may be avoided. Therefore it is necessary that the state directors carry on all their correspondence with the States Relations Service and not with the various bureaus and offices of the Department of Agriculture or with individuals therein. We cannot secure the best administrative results if we, on our part, "short-circuit." What is sauce for the goose is sauce for the gander.

If the memorandum of understanding is to be effective and the plan of cooperation thus outlined is to proceed, it is absolutely essential that all parties to the agreement be ready at all times to do everything in their power to facilitate its operation. Violations of the memorandum on the part of state representatives should be brought to the attention of the proper committees as well as violations on the part of the Department of Agriculture. Naturally all these violations should be adjusted, if possible, by the parties concerned without bringing them before conference of this Association. If, however, violations are frequent and persistent, and if they indicate policies opposed to the general memorandum of understanding, or show a wrong attitude on the part of either any state extension service or the Department of Agriculture, they should be brought promptly to the attention of the proper officers of this Association.

G. I. Christie,
W. R. Dodson,
Alva Agee,
Wm. D. Hurd,
H. L. Russell,
C. W. Pugsley, *Chairman.*

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On motion, the report of the committee on extension organization and policy was received and the Executive Committee instructed to secure its advance printing and distribution in accordance with the terms of the resolution passed at the Convention of 1915 (Twenty-ninth Proceedings, p. 151), the number to be printed to be left to the discretion of the committee.

THE PRESIDENT. The chairman of the Executive Committee will now make his final report.

REPORT OF THE EXECUTIVE COMMITTEE

W. O. THOMPSON. The Executive Committee submits the following report for consideration and action.

1. The committee recommends that the annual dues for the coming year be the same as for the current year, namely, thirty-five dollars for the colleges and twenty dollars for the stations.

2. The committee directs attention to the fact that it seems necessary for some of the standing and joint committees of the Association to meet occasionally during the year, and that the expenses incident to such meetings should be met by the Association. It therefore recommends that such expenses be paid whenever a committee meeting has been previously authorized either by the Association or by the Executive Committee.

3. The committee expresses its belief that the amount of work required of the secretary in editing the proceedings, in addition to the ordinary work of the usual clerical order, is more than should be expected without some recognition. The Association cannot employ a paid secretary, nor can it remunerate a secretary for his time and labor. It therefore recommends that it be authorized to pay an honorarium to the secretary, provided in its discretion the finances of the Association will warrant such action.

4. The following resolution was presented by President Butterfield:

"That the secretary of the Association be empowered in cooperation with the bibliographer to make, or to have made, a general index of the proceedings of this Association for all the conventions held during its history."

The committee recommends that the matter be referred to the Executive Committee with power to act, provided the expense in its judgment be not excessive.

5. The following resolution was referred to the Executive Committee from the committee on extension organization and policy:

"Whereas the relation of an extension director to his state agricultural college as the administrative head of an important department of college work is a vital one.

"*Resolved:* That it is advisable as a matter of policy that all of his salary as director of extension should be paid from college or state funds."

The Executive Committee recommends the approval of the resolution and that the Association commend it to the colleges for favorable consideration. Of course the Association can not command this situation. However, the committee felt that the resolution set forth a desirable policy and simply recommends it to the colleges.

6. The committee directs attention to item 4 in a report adopted November 14, 1916 by the National Association of State Universities, which reads as follows:

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"Your committee also recommends that the National Association of State Universities invite the Association of Land-Grant Colleges and Experiment Stations and the Association of State Normal Schools to unite in the formation of a joint committee for the consideration of the entire problem of federal aid in support of education, and that the joint committee report to a joint meeting of the three associations in November, 1917."

The committee recommends the acceptance of this invitation, subject to a change in date provided this Association should meet at Springfield in October, 1917, and that a committee as suggested be appointed.

7. The following statement, presented by Prof. Edward Orton, Jr., (see pages 152-163, especially 163) is recommended for approval:

"The Association of American Agricultural Colleges and Experiment Stations desires to call the attention of its constituent colleges to the Act of June 3, 1916, entitled "An Act to Increase the Efficiency of the Military Establishment of the United States," and especially to those sections providing for an Officers' Reserve Corps, and a Reserve Officers' Training Corps, and to urge:

First. That in adapting themselves to the operation of this law they shall enthusiastically support the objects sought by this legislation.

Second. That in providing for the new military courses, they shall accept credits in theoretical military subjects up to the amount of 12 credit hours as general electives for any degree for which electives are accepted, and as substitutes for required work in any course in which no elective work is offered, in order that students desiring to qualify as reserve officers may not be penalized by loss of their chosen degree or required to do more work to obtain it than others who do not elect the advanced military work."

8. The committee recommends that the following persons be requested to attend, without expense to the Association, the conference to be held in New York, Saturday, November 18, on the Newlands bill. The Chairman of the Executive Committee, Presidents W. E. Stone of Indiana, W. M. Riggs of South Carolina, W. J. Kerr of Oregon, R. A. Pearson of Iowa, G. P. Benton of Vermont and W. H. S. Demarest of New Jersey, Deans A. Marston of Iowa, G. W. Bissell of Michigan, A. A. Potter of Kansas, J. G. Scrugham of Nevada, W. F. M. Goss of Illinois, Professors H. W. Tyler of Massachusetts and A. A. Titworth of New Jersey; and that any other members who may happen to be in New York at that time be invited to attend.

9. The committee has had under consideration the several resolutions bearing upon the establishment of engineering experiment stations as presented by members of the Association and also the general trend of the remarks offered subsequent to the formal papers presented in the program. It recommends that these resolutions be printed in the proceedings and that the Association adopt the following statement:

"Resolved: That the Association of American Agricultural Colleges and Experiment Stations reaffirms its belief in the advisability of the establishment of engineering experiment stations and of federal aid to that end; furthermore, the Association declares its belief in the soundness of the principle that federal aid for such purposes should follow the line of precedent already established as expressed in the Act of 1862 popularly known as the Land-Grant Act, and in the Acts supplementary thereto, and that no local or temporary conditions should divert the Federal Government from allegiance to this principle and method.

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"Further *be it resolved:* That the Association instruct its Executive Committee to use its earnest endeavor for the passage of the Newlands bill, properly modified and amended. The Association expresses the opinion that the range of papers and discussion before this Association should guide the Executive Committee in its efforts to assist in the framing of a bill that shall accomplish the end sought, namely, a system of engineering experiment stations initiated by the Federal Government and operated by the States in cooperation with the colleges represented in this Association."

10. The committee recommends that all matters pertaining to the organization of the units of the Reserve Officers' Training Corps involving adjustment or modification of the regulations issued by the War Department, be referred to the Executive Committee with full power to represent the Association.

11. The committee recommends that it be given power to act in case of any unfinished business or resolutions overlooked at the closing session. This recommendation is unusual, and it is made simply because in the press of business some matters may have been overlooked. If adopted, no question can arise as to the legitimacy of any action the Executive Committee may deem it wise to take.

Respectfully submitted,

W. O. THOMPSON,
Chairman.

On motion, the report of the Executive Committee was received and the recommendations in items 1 to 11 inclusive were adopted.

On motion, referring to item 4 in the report of the Executive Committee, the secretary was requested, in case the general index was issued, to include a list of all former officers.

THE PRESIDENT. The next order of business is the consideration of matters pertaining to the Reserve Officers' Training Corps. An historical statement will be made by the Chairman of the Executive Committee, followed by papers by Presidents G. P. Benton of Vermont and W. M. Riggs of South Carolina, and by Professor Edward Orton, Jr., of Ohio.

THE RESERVE OFFICERS' TRAINING CORPS

HISTORICAL STATEMENT

BY W. O. THOMPSON

The Reserve Officers' Training Corps comprises Sections 40-53 inclusive of the National Defense Act, commonly known as the Hay-Chamberlain Military Act. This measure is the result of a series of bills and conferences aided by the state of the public sentiment on the general question of preparedness.

In 1913 before this Association, Professor Edward Orton, Jr. of the Ohio State University read a paper on "The Status of the Military Department in the Land-Grant Colleges" (Twenty-seventh Proceedings, pp. 172-183). He set forth somewhat at length the advantages of military education from the standpoint of its discipline, its aid to physical development, its intellectual advantages, and as a contribution to the development of character. Certain technical advantages were also presented and suggestions offered as to improvements that might be made in the administration of the

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Land-Grant Act, including a more frequent examination of the colleges by the War Department, a larger provision for detailing officers and the appointment of graduates properly qualified as temporary second lieutenants in the Army. The paper was an earnest plea for a larger use of these colleges by the Federal Government for the preparation of citizens and of young officers who might be available in time of need as educated and trained men. The paper further urged with some earnestness the duty of the States and the colleges to emphasize more distinctly their military features.

The discussion at that time was led by Major-General Leonard Wood, then Chief of Staff, who spoke with cordial approval of the general principles of Professor Orton's paper, and added some interesting and valuable data upon the general conditions in the country. He was followed by Captain, now Major, S. J. Bayard-Schindel of the War College Division, who stated that the paper was in line with the ideas prevailing in the War College. His familiarity with the conditions among the colleges growing out of his duties as an inspecting officer enabled him to speak with a clear apprehension of the problems which were involved. The Association went on record approving the main features presented in the paper and in the discussion (Twenty-seventh Proceedings, p. 143; Twenty-Eighth Proceedings, pp. 155, 156; Twenty-Ninth Proceedings, p. 152).

Meantime, the McKellar bill, H. R. 8661, was before Congress without any very serious consideration. This same bill, reintroduced in the next Congress as H. R. 11872, proposed a system of military education providing for an essentially military school in each State, somewhat similar to West Point. It required a guaranty of at least 300 students in each institution and in several respects seemed impracticable as applied to existing institutions. By the time the Association had met in 1914, and European War was well under way and the public mind was aroused on the question of national defense. This sentiment was reflected in the action of Congress as expressed in resolutions looking toward an increase in both Army and Navy and in preparation for general defense.

In November, 1915, the Executive Committee of this Association met with committees from the War College, the National Association of State Universities and the Association of Military Academies. Problems relating to the preparation of young officers in a Reserve Officers' Training Corps were freely discussed in this joint conference. As a result, an outline of a bill was agreed upon looking toward the further utilization of the Land-Grant Colleges in military education and such utilization of other schools and colleges as these institutions were disposed or prepared to agree to.

In the meantime, on December 17, 1915, Senator Atlee Pomerene of Ohio, introduced Senate Bill 2709. This bill had been drawn by Professor Orton in collaboration with Major George L. Converse of the Ohio State University. It provided for a Reserve Officers' Training Corps for summer camps and included the main features of the statute now in force. A substitute for this bill, known as Senate Bill 3946, was presented by Senator Pomerene on January 25, 1916. This bill, while not differing in principle from the first one presented, was modified in harmony with the suggestions made at the conferences above referred to. On February 4, 1916, the Honorable Warren Gard of Ohio, presented in the House of Representatives H. R. 10845, an exact reproduction of Senate Bill 3946.

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In the meantime the McKellar bill had been approved by the House Committee on Military Affairs and reported for passage. At this juncture the Executive Committee sent a circular letter to all college presidents concerning the McKellar bill and urged a hearing before the Committee on Military Affairs. The net result of this action was that when the matter came to a vote, the McKellar bill was defeated and the Gard bill was substituted for it.

When the National Defense Act went to conference, the Reserve Officers' Training Corps sections were agreed to in conference as passed by the House of Representatives and became a part of the law.

It is not the purpose of this paper to discuss the measure, but briefly to direct attention to the processes through which the existing law was enacted. It should be said in passing that the adjustments and amendments to the bill as agreed upon in the conference referred to above, were made after a conference with the committee from the War College and representatives of the National Association of State Universities, of the Association of Military Academies and of this Association. A few men at their own expense, out of genuine interest, rendered valuable aid. Especial mention in this connection is due to Mr. Ralph D. Mershon, a consulting engineer of New York, who aided in drafting the bill and enlisted support from engineering societies and from many prominent engineers the country over. As has been heretofore stated, Professor Edward Orton, Jr., in association with Major George L. Converse of Ohio, was responsible for the original Pomerene bill which served as a basis for further discussion and for the present existing legislation. The Association is also under obligation to Senator Pomerene and Representative Gard of Ohio, to whose diligent watchfulness and tactful management must be attributed much of the success which has been attained. The cooperation of the committee from the War College was courteous, efficient and of the highest utility.

The Chairman of the Executive Committee may here be permitted to say, that in the opinion of a great many people outside of those immediately concerned in securing the passage of the Reserve Officers' Training Corps bill, this portion of the National Defense Act is probably one of the most effective portions of the entire measure and the one that will stand longest with the least adverse criticism. The hope is here expressed that the Land Grant Colleges will be able to operate the measure with that persistent enthusiasm without which no great movement can have a permanent and abiding usefulness. The purpose in the minds of those proposing and supporting this measure was to develop throughout this country a constant supply of educated young men with a sufficient military training to warrant their appointment as second lieutenants. It was their belief that such a body of young men would aid in the maintenance of a rational attitude of mind and a proper public sentiment on the general questions of national defense, and that our system of education from the standpoint of citizenship would be substantially improved. The attitude of Congress and of the Federal Government in general was cordial and cooperative. With a proper adjustment between the War Department and these colleges, there is every reason to believe that this portion of the National Defense Act will through the years prove to be highly beneficial and an important contribution to our citizenship, as well a vital factor in national defense.

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Problems and Opportunities Presented by the New Federal Army Reserve Law

By G. P. Benton

The history of the origin, development and enactment of the law for the better utilization of the Land-Grant Colleges and State Universities in training for efficient membership in a Reserve Officers' Training Corps to serve the country in times of national crisis, has been fully recited by President Thompson. The great significance of this measure can hardly be over-estimated. It represents a movement in the direction of improved military efficiency through promise of a trained leadership of the largest intelligence.

I shall not be charged, I hope, with any disparagement of the work accomplished by the United States Military Academy in the intimation that the personnel of the army will be improved through larger use of the liberal and technical colleges and universities of America to supplement the limited opportunities for the training of army officers now afforded at West Point. The need of a larger number of trained officers, ready for prompt response to a call to the colors in times of great emergency, has come to be recognized in recent years as never before.

One of the distinguished active army officers of our own times has declared that the Civil War might have been ended in two years if the country had been able to call to company and regimental leadership a sufficient number of trained officers. At the outbreak of the war between the States, volunteer companies were speedily organized and captains and lieutenants elected with no more knowledge of military science and practice than men in the ranks. Much of the loss of life that occurred on both sides during that fratricidal struggle might have been averted and the issues more speedily settled with officers trained to instruct and make effective the enlisted men from the outset. This was true also in the War of 1812, as well as in the War with Mexico. It is true today, but after a few years when the new law under consideration shall have produced its best results it need not be so.

Henceforth the training of officers at West Point is to be supplemented by the Land-Grant Colleges and State Universities of America with such other colleges as may choose to take advantage of this Act. A great reciprocal benefit is thereby assured to students in the United States Military Academy and in the various state institutions. West Point men will be stimulated to make themselves equal in general cultivation to officers trained in civil institutions. State educated officers will have the incentive of the intensive training enjoyed by brother officers at West Point to spur them on in their efforts to achieve technical excellence in military science and practice. The new law is significant also in the prophecy of improved military effectiveness and the assured minimum sacrifice of limb and life in time of war.

The various Land-Grant Colleges are in reality after all federal rather than state institutions. The Morrill Land-Grant Act and subsequent measures have resulted in the establishment of institutions of joint state and federal support. One of the provisions of the original law prescribes certain studies to be pursued, including military drill, and that provision in the main has, for the most part, been faithfully followed by these colleges. For more than 50 years these Federal Land-Grant Colleges

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of separate existence, or in conjunction with the State Universities to which, in many States, they are related, have been making earnest endeavor to fulfill their contractual obligations to the Federal Government. Those familiar with the operation and results of the military training law in these institutions will be far from pronouncing it a failure. It has accomplished large good for the country in giving a considerable body of intelligent citizens some conception of war problems and a fair appreciation of their importance.

It is unjust to condemn the military training the Land-Grant Colleges of America have been conscientiously conducting for more than half a century as altogether perfunctory. Ignorance of the facts is the only excuse for so unwarranted an assertion. That the military training required by the Morrill Act has been painfully inadequate, all responsible for its execution freely admit. Federal authorities are, perhaps, primarily to blame for failure to appropriate all the potentialities of their own institutions. Until General Leonard Wood became Chief of Staff, the War Department officials never visualized aright the opportunities for military education open to them in the Land-Grant Colleges. Various misconceptions of duty and purpose contributed to the friction which prevented smoothness of operation and satisfactory performance. There were misunderstandings of the law and unwarranted expectations on the part of officers detailed as professors of military tactics and as commandants. Officers commendably anxious to render good service have often been over-zealous in their attempts to transform these institutions into military academies. They have usually, in due season, met with necessary disillusionment.

A technical college or liberal university is not a military barracks. The chief mission of such an institution is to develop an efficient citizenship free from the compulsions and restrictions that are imposed by the typical military academy. It is quite inconceivable that a manhood of largest personal initiative can be grown in an educational institution exclusively military in character. Our land-grant colleges exist to dignify service on farm, in shop, in classroom, and profession, and the military training given is simply incidental thereto. It should not be neglected or even treated lightly. If accepted as a serious responsibility by students and administrative officers, it can be made of inestimable value in guaranteeing a continued preparedness for the safety of our citizens and our national honor.

Military professors and commandants, in some instances, have been inclined to claim a larger share of the financial support than the federal laws allow for the operation of the military departments in the Land-Grant Colleges. Some of them have even insisted that half of the annual educational appropriation should properly go to the military departments in the several institutions. They have even been disinclined to accept as final the decision of the United States Commissioner of Education, backed up by the advice of the Department of Justice, that no part of the $50,000 Morrill fund can be used for military service and that it is only from the land-scrip funds that any financial support can properly be accorded to military instruction.

If our Agricultural Colleges and State Universities have failed to any extent in getting results of a satisfactory military character, it has been because of the failure of the War Department to cooperate with these institutions in providing students with proper incentives for excellence in mili-

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tary studies. Until very recently details have been made for our several colleges without any encouragement other than that of a perfunctory annual inspection, and the slight recognition of a single appointment from graduates of institutions ranked in the "distinguished class." The only basis of appeal for interest in military training among undergraduates has been the intangible one of an abstract patriotism calling them to get ready for service to country in a possible future conflict so remote as to be both invisible and inaudible.

Now under the new law all this is to be changed. The potential value of the opportunities both to the college and the military arm of our government can hardly be overestimated. When this law shall have done its perfect work, we shall have trained army officers of larger general culture than the United States or any other nation has hitherto known. Military education as features of the curricula of the ordinary arts, scientific or agricultural courses will guarantee officers of greater intelligence than have heretofore been possible. Military training in approved institutions will, no doubt, be improved with the experience of added years. Thus the colleges and universities of America may ultimately become the means of creating an adequate number of reserve officers who will prove to be our best guaranty of safety from hostile attacks without and whose admitted readiness to lead in national defense will promote the ends of permanent peace.

The inspiration of the recognition given to students in our colleges by the War Department authorities under the permissive provisions of the new law will surely be made valuable incentives to military study. From this time forward freshmen will not be required on their first day in college to invest a considerable sum for a uniform. The furnishing of all equipment by the Federal Government will give our students a feeling of pride in the conscious partnership they enjoy with the government of their country. Summer camps conducted without expense to students will stimulate exertion for improved efficiency as soldiers and the compensation in the "commutation of subsistence" guaranteed to college juniors and seniors electing to continue military study during the two final years of college life, will increase by one hundred percent the military knowledge and efficiency of our graduates. Temporary commissions as second lieutenants immediately following graduation, will afford valuable experience in the line and at army posts that will accentuate efficiency in war if these men are ever called to the colors as officers in later years. The promised acquisition of $600 capital within six months after graduation as the result of the $100 a month stipend during temporary service, will make strong appeal to the young college man who lacks a financial foundation on which to begin his active career or to commence graduate or professional study.

The reserve officer's commission assured after six months novitiate in the Army will bring through all the years of this relationship the consciousness of a concrete patriotism born of the knowledge that there is readiness to answer the call of country whenever it may come. Increased national self-respect and esprit de corps will be the inevitable results of membership in the Officers' Reserve Corps.

The fact that the new law will provide more commissioned officers as professors and assistant professors with the addition of non-commissioned officers as instructors is promise sufficient of an improved service and a better training which will inevitably produce a more lively interest among

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students and a greater respect for our college departments of military science and tactics.

The new law presents new problems, but they are largely those of readjustment. The previous requirement of three hours a week of military drill during the first two years must be increased to five hours weekly for students electing further study and training during their junior and senior years. Those responsible for the genesis and enactment of the law and most anxious for its vindication through ultimate returns will hardly insist that it is now ideal in every detail for the accomplishment of its worthy purpose. Only the initial steps have been taken. Like all statesmanlike measures for the national welfare, the new law will necessarily be perfected through experience with its trial in application. Accepting it as a good beginning directed toward an important end, elements of weakness will be discovered at certain points in attempts to make it work out satisfactorily in practice. These discoveries will suggest amendments which Congress will doubtless be glad to make from time to time for the assurance of the best results. Meanwhile, infinite patience on the part of the War Department and among college authorities will be necessary in making readjustments with the minimum of friction.

To correlate the course of military instruction prepared by the General Staff with other college work and to make it worth the credit it is to receive, will require some study. The problem is far from impossible of solution. Despite the admitted short-comings of military education in our Land-Grant Colleges during these 50 years, the officers detailed as professors of military science and tactics have, for the most part, been conscientious commandants and capable instructors. If they have erred in any respect the errors, as before intimated, have been chiefly those of ill-advised zeal in attempts to do more than was practicable.

The charge that "officers have sought college details to secure four years of vacation from work" is not warranted by the facts. These men, so far as I have known them, have been soldiers of the finest type. They have taken their duties seriously and have discharged their obligations with the self-abnegating spirit of true patriots. The chief complaint to be lodged against the present system is the limited period of service allowed to those detailed for college duty. Officers barely get their work well organized before they are transferred back to their regiments and the colleges suffer great loss of momentum in their military departments while new commandants are getting acquainted and adjusted. This is a real difficulty and one that must be eliminated if the Reserve Officers' Training Corps is to be all it may be.

The so-called "Manchu Law" may have some merit, but it certainly should be so amended as to exclude college details from its restrictions upon army officers for detached service. If educational institutions are to be utilized to the uttermost in military training it is absolutely imperative that unity of policy and sequence of work be guaranteed, as in other academic departments, by continuing army officers at the institutions to which they may be sent so long as the service is satisfactory to all parties concerned.

The summer camps required by the new law constitute another problem which must ultimately be worked out with the minimum of hardship to students to assure the maximum of efficiency in the Reserve Officers Training Corps. The majority of young men in our Land-Grant Colleges and

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State Universities need their summer vacation period for remunerative employment, without which the continuation of their studies during the succeeding months of the regular academic year would be impossible. The summer camp, with its exclusive military atmosphere and all thought centered on the work of soldiery, is apparently indispensable. The War Department officials believe it can have no satisfactory substitute. College authorities may, therefore, find it necessary to excuse students from other regular work, without discredit therein, for four weeks during each of the last two years out of the four of the required college course in order to make full compliance with summer camp requirements.

The Land-Grant Colleges originated the movement which has eventuated in the "Reserve Officers' Training Corps" law. These institutions will necessarily be the chief dependence of the Federal Government in supplementing the work at West Point for the training of regular and reserve officers. Their work must not be disparaged or its value minimized by concessions to other colleges or universities in allowing any substitutes for the routine of tactics and drill during the freshman and sophomore years. This soldierly routine is unique in its educational value and is a fundamental step in training for intelligent military efficiency. The Agricultural Colleges and State Universities should oppose, with all earnestness, any discrimination against their students in special permissions granted to students of non-state institutions for recognition as reserve officers of the United States Army without the preliminaries of two years' faithful attention to military drill in the cadet uniforms prescribed by the War Department. Any institution whose management feels that drill on its campus is a humiliation and that the uniform of the United States is discreditable should be denied the privilege of a military detail and refused governmental recognition.

Temporary embarrassment has been occasioned by the failure of Congress to appropriate money for the purchase of uniforms and equipment and to pay "commutation of subsistence" as required by the Reserve Officers' Training Corps provision previously passed by that body. Assurance is given by the War Department that in the estimates to be presented to the coming session of Congress the passage of a retroactive clause will be urged so that students of the current year may, in due season, be reimbursed. The Federal Government cannot afford to discredit this new law at the outset by any apparent breach of faith with the intelligent young manhood in our American colleges, and the Secretary of War should be urged to use the extreme limit of his authority in declaring an immediate emergency in order to fulfill the pledges of the federal law.

By way of summary it may be said that firmness coupled with some measure of flexibility will enable those interested in compliance with the requirements of the law and the enjoyment of its benefits to evolve policies and procedure satisfactory to the colleges and to the Federal Government. The new measure may not be faultness in every detail. It is no disparagement of its general value to the colleges and the country to admit that it is not in every respect satisfactory. It marks the beginning rather than the completion of a movement.

The evolution of military training in this country has been appreciably accelerated by the War Department, the Congress and the President of the United States in the challenge presented to the colleges for the training

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of reserve officers for the United States Army. The consummation of the ideal will be realized in the fullness of time.

The Reserve Officers' Training Corps

By W. M. Riggs

When I came to Washington a few weeks ago to attend a conference at the War Department, I knew little of the meaning of the terms of this act, and I have found in conference with members of this Association that many of them had no clear idea of what it means to the Land-Grant Colleges. I believe that a simple statement of its terms will suffice for my part in this program and may be of service to several of our members.

Any Land-Grant College which requires two years of military training of all of its physically fit male students, who are pursuing courses that require not less than two years for completion, and which requires a successful completion of these first two years of military work as a prerequisite for graduation, is eligible to establish a unit of the Reserve Officers' Training Corps and to enter the so-called senior division. Application to enter must be made in prescribed form to the Presdient of the United States. Such arms of the service may be established at the college as are approved by the War Department. The prescribed course of study embraces a basic course, three hours per week of military instruction during the freshman and sophomore years, and an advanced course of five hours per week during the junior and senior years. Students during the first two years assume no obligations except to do the work satisfactorily and receive no compensation except one olive-drab uniform outfit. At the end of the sophomore year, students who are selected as fit for further military training by the college president and the professor of military science, may elect to continue the course, agreeing in writing to complete the prescribed course of the last two years, and in addition to attend during vacations two four-week periods of camp instruction under federal supervision. If the student has already attended such camp following his freshman and sophomore years, he may be credited with one or both of these periods. One of the four-week periods may occur after graduation, or service as a temporary second lieutenant may take the place of the last of these periods. The Federal Government pays all camp expenses, including transportation, uniform and subsistence. During the junior and senior years it furnishes one uniform and allows commutation of rations amounting to approximately nine dollars per month during the college session of nine months. The student in electing to take the last two years of training assumes no obligation except to complete the course. It is hoped, however, that he will enlist as a reserve officer for a period of not less than ten years, subject to call in times of war or threatened hostilities, to serve in a capacity not lower than the rank he holds in the Reserve Officers' Corps. During the period of enlistment reserve officers are subject to duty with troops or at field exercises, or for instruction for 15 days in each year, and while serving they receive the same compensation as do officers of the same grade in the regular army. After completing the course, the graduate may apply and be appointed by the President of the United States as a temporary second lieutenant, for the purpose of instruction, for a period of six months, during which time he would receive

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$100 per month together with the usual allowance now provided by law for army officers.

At colleges now requiring three hours per week of military training for all four years, for two hours' additional work per week a student would obtain a uniform and $81 per year in cash, with the privileges of the two four-week encampments and an appointment after graduation. The college secures a larger teaching staff of army officers and enlisted men sufficient to make the military instruction measure up to the standard of other departments.

To summarize the matter, a student who enters the advanced course of the last two years of the Reserve Officers' Training Corps assumes certain obligations, receives certain compensations and is afforded certain opportunities.

His obligations are as follows:

(1) He must carry out the prescribed military course of five hours per week to completion.

(2) He must attend during summer vacations two four-week camp periods.

(3) He should enlist in the Reserve Officers' Corps for ten years, and be subject to 15 days duty in each year of that enlistment.

His annual compensations are as follows:

(1) One complete service uniform, worth $10.36.

(2) Commutation of subsistence at $9 per month for nine months, $81.

(Both of these are at present uncertain, because not the subject of specific appropriations by Congress).

His opportunities are as follows:

(1) To attend two four-week camps at the cost of the Federal Government.

(2) To be appointed for a six-months period after graduation as a temporary second lieutenant, provided the appropriation is available and the President of the United States sees fit to make the appointment.

(3) To get a 15-day vacation each year while on the reserve list, with full army officer's pay and all expenses.

(4) In case of war, to serve the country as an officer and not as a private.

I am in hearty accord with the purposes of the new enactment and the War Department's General Orders No. 49 interpreting it. But I cannot escape the fear that the plan will not bring the results expected. I am afraid that the majority of our technical students will look with special apprehension on their post-graduate duties and obligations, and that only a few enter the advanced course. In the South, where college education is comparatively inexpensive, and many of the people who patronize colleges are poor, the commutation of subsistence will be considerable help to many young men; but in the more expensive colleges of the country the monetary consideration will be a negligible inducement.

In the end the patriotism of our college men and a belief in the value of military training for its own sake, rather than the pecuniary benefits which the plan offers, must be depended on to carry it to a successful issue.

There can be no question of the value of this course of military training for its own sake. It is well worth the while of any young man to take it all, including the six months detail as second lieutenant. But this is

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unfortunately a day of self-indulgence, of industrious seeking for paths of least resistance, of trying to get something for nothing.

To those colleges desirous of carrying out in good faith the military provisions of the Act of 1862, the new law provides a proper and reasonable basis for full compliance. Though not a single cadet enlisted for the advanced course of the third and fourth years, the advantages to the freshman and sophomore classes in a better and more varied curriculum, better equipment and a larger instructing force, should be a sufficient inducement to the college to become a unit in the Reserve Officers' Training Corps. Add to these advantages the government-furnished uniform and the possibility of attending without expense the splendid four-weeks summer camps of instruction, and for the first time you have the opportunity really to interest young men in what has hitherto been the rather humdrum business of killing two or three hours per week with mere perfunctory drill.

Regardless of what individual students may do, every Land-Grant College should set an example in patriotism, and self-interest as well, by enlisting at once in the "Reserve Officers' Training Corps."

The Land-Grant Colleges and their Part in the National Defense

By Edward Orton, Jr.

The Morrill Act of 1862 laid upon the educational institutions created under its provisions the obligation to give military instruction. The terms of the law were very general. The intended scope of this instruction was not expressed and each State, through its legislature, was left to decide what amount and kind of military instruction should be given. Naturally there arose much diversity in this respect, as the several institutions came into existence.

From time to time the War Department has been authorized and directed by Congress to provide instructors and equipment for the carrying out of this military program. The help thus furnished has always been inadequate in quantity, entirely insufficient to develop training in military science as any other subject in the college curriculum would have been developed. In all of the legislation enacted for these purposes during 50 years, Congress has never rectified the weak spots of the basal law. It never defined the kind or amount of military training to be given, never gave the War Department express authority to control the military training which its officers were appointed to supervise, and never made any arrangement officially to recognize or make use of the fruits of this military instruction for which it was spending money and effort. Assuming that it was the purpose of the American people to strengthen their military efficiency by giving instruction to young men of the professional class during their period of higher education, it would be hard to imagine a more slipshod, inefficient, unbusinesslike system than we have evolved; a system where neither the school nor the War Department are definitely in control, where neither have power to go ahead and do the obviously necessary thing, and where the whole thing is rendered aimless and futile in the minds of the young men who take the training by providing no subsequent use for their military knowledge, by connection with the Army, the Militia, or an Army Reserve. If our other national enterprises were conceived and carried out with no more acumen than this, we would assuredly fail in our first real international competition on equal grounds.

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This Association took cognizance of this unsatisfactory situation in 1913 and charged its Executive Committee with the matter of doing something to rectify it. The breaking out of the great war in 1914 forced the attention of the American public to our military unpreparedness and speeded up the action of Congress, so that on June 3, 1916 a bill was passed embodying, among other matters of the most profound importance to Americans, legislation intended to do away with the above mentioned inconsistencies and weaknesses. This legislation in its final form embodies substantially what the Executive Committee of this Associaton itself suggested. It was naturally modified to some extent by the War Department and also the influence of other groups of schools, but the modifications do not seriously alter the general plan.

The provisions of the Hay-Chamberlain bill which are of immediate and direct concern to the Land-Grant Colleges are two, namely: The Officers' Reserve Corps and the Reserve Officers' Training Corps.

THE OFFICERS' RESERVE CORPS

The War Department has for years recognized that a reserve of properly trained army officers is an absolute essential to any scheme for national protection. They have argued and plead for it. Now, for the first time in the history of the country, have they induced Congress to take the step so vitally necessary towards building up our military efficiency. For us in particular, a Nation of a non-military character, to which the very idea of military power is hateful by tradition and by taste, the creation of a powerful reserve is more necessary than in a military nation. We will not yet consent to building up large active forces in time of peace—and the smaller and more skeletonized our active forces are kept the greater the necessity of a trained reserve to draw upon in time of war. Preparedness consists much more in having a trained competent reserve of educated officers to administer an enlarged army than it does in any other thing. Munitions, supplies and men can all be obtained—not as quickly or as easily as has been frequently proclaimed—but the trained human intelligence to direct, coordinate, and use our man power and our munition power is the one thing that we cannot get quickly. The cry of the European nations since August, 1914, has been for officers, officers, and yet more officers. The shifts to which our English and Canadian cousins have been put for officers and the consequence of their shortage should be the one great outstanding lesson of this war for Americans. We are organized more nearly on their system than any other; their case offers the closest parallel to our own. And our plight would be much worse than theirs, if we came to war.

It seems that Congress has learned, or is learning, this lesson. The provision of an Officers' Reserve Corps of 50,000 is a modest beginning. It is only a beginning. Over 200,000 officers were used on both sides in 1861-65. Future armies will not be smaller ones, we may believe.

Where shall we now get 50,000 reserve officers? And in 10 years or more, when we see the light more fully, where shall we get 100,000 or 200,000 more? Remember that these places cannot be filled by mere appointment. A reserve officer should be an educated, trained man—able at once to take secondary command of troops and capable of rapid development into a first line officer. Today the War Department is strenuously

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trying to fill many hundred vacancies in its regular army officers' list. Every graduate of West Point was this year promoted to a first lieutenancy on his graduation day. The country has been combed for likely material. Passing requirements are being made easier than ever before. Graduates of reputable colleges are excused from examination in all or most of the mental requirements. Applicants are being advertised for in the daily press. Never before in time of peace has this spectacle been witnessed. Months after the law doubling the size of our little army has been passed we find ourselves unable to enlist men to fill the ranks, or to find officers to handle them. And this, with all the glamour of social prestige, salary inducements and rapid promotion that the officership in the Regular Army carries with it!

Briefly, we must expect to get our reserve officers chiefly from the following sources:

1. Regular army officers, who have resigned from the Army on their own initiative to follow civil life. Of these there are a very few. .
2. Militia officers, who have resigned from active duty.
3. Graduates of essentially military private schools.
4. Graduates of army training camps.
5. Graduates of private universities and colleges where optional military training is given.
6. Graduates of Land-Grant Colleges, where military training is compulsory.

The first two classes will supply the first officers to the Reserve Corps, and, probably, the most immediately competent and serviceable; but no argument is needed to show that their numbers are practically negligible. The total number of ex-officers of regular army and militia of military age cannot exceed 5,000, and probably would not net 1,000.

The third class is a more promising source of supply, not as to immediate results but from the element of continuity. The private military schools are practically all of academy or preparatory and school grade and deal with young boys up to 17 or 18 years of age. The graduates generally go either into business life or into college. From the latter portion it is fair to expect a good many reserve officers, usually some years after graduation from the military school. Those who go into business would not be educationally far enough along to make efficient officers, even though their military training has been good.

The fourth group, comprising the product of the United States army training camps for civilians, the so-called Plattsburg plan, seems an important one, though its ultimate value is not yet proven. There is legitimate ground for differences of opinion on this subject. The writer, although considerably above military age, attended one of these camps at Plattsburg, successfully completing a full term of four weeks in the summer of 1916, for the purpose of studying this movement at first hand. The experience was a most enjoyable and illuminating one, and well worth all it cost. But it left the conviction that these camps as a source of trained army officers, intellectually equipped for their difficult task, are not of much present importance. I yield to no one in appreciating their importance as an influence in educating the people of this country to their military weakness, in dispelling the foolish and dangerous idea that an intelligent man can become an efficient officer on short notice, and in laying the foundations for universal military training of our youth. Their

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effect as observed upon the minds of great numbers of educated men who took the training this summer is to convince them, almost to a man, of the impossibility of making efficient officers in a short time of preparation, no matter what the education and social grade of the material operated upon may be. They left an attitude of humility rather than arrogance. Their value as a present or future source of trained military leaders, or even as a mode of instilling high-grade military discipline into those who attend, in my opinion is not great. The training is not long enough or thorough enough to get far, and at the bottom lies the old besetting weakness of all American military effort—the volunteer system. So long as a man can quit whenever the exigencies of the service make his life unpleasant, high-grade military discipline, which alone makes dependable men, cannot be had.

The Plattsburg movement has not up to the present furnished a large number of reserve officers. In spite of the fact that every possible effort and every inducement has been made to get the men to apply for reserve commissions, no large response was obtained—only about 300, I believe, thus far, out of approximately 20,000 who have taken the training. Nor was there a large number of really fit men who could have applied. It is likely to become a larger movement before it becomes smaller; it is likely to supply more officers to the Reserve Corps in future than it has done so far; but there is no guaranty that upon the conclusion of the European war, with this country still fortunately remaining at peace, the popular interest in the Plattsburg movement may not dwindle and die, and, as a source of reserve material, practically disappear.

The fifth group, comprising the graduates of universities and colleges on private foundations, which have of late shown an active and commendable interest in military education, is still an unproved asset. It is a hopeful sign that so many colleges that do not have to, are contemplating military training. Great good is certain to come, whether its output of trained military leaders is large or small. But in most cases these universities have started in badly, making two glaring mistakes. In the first place they have made the drill optional. Optional drill never will succeed. In time of stress, like the present, it may do pretty well for a while, but in the long run, the American college boy will not drill if he does not have to. Furthermore, optional drill cannot develop real discipline. A student, under the optional system, reproved sharply by an officer for a breach of military etiquette, can always find a way to withdraw from military work and thus avoid the exact lesson in obedience and self-control that he needs. Then secondly, these schools seek to avoid the frequent physical drill, and to substitute work consisting largely of lecture courses supplemented by summer camp instruction to be given by the army training camps. This system cannot succeed. One might as well try to build the roof of a structure before its walls are erected. Even a civilian can realize in some degree the ideas of military strategy, when listening to an able lecturer, but no one can use knowledge of this class until he knows and can personally perform the duties of a soldier, can command the evolutions of small bodies of troops and by doing these things in the field can acquire military judgment. The drill is the laboratory for military studies. We all seem to have accepted the laboratory system in teaching chemistry, physics, biology, engineering and agriculture. Can we be foolish enough to believe that military science should be the one subject to hark back to the lecture

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method? Furthermore, the summer camp is not the place in which to secure fundamental training in drill. It is a splendid place to get the larger strategic conceptions, and to learn the art of living in the open, but it should be preceded by thorough and adequate drill of the type easily taught in drill halls or upon the campus. The daily or frequent repetition of drill, building up slowly the habit of military restraint and obedience, is an essential part of the method, and this appears to be what our newly converted rivals in the military school field do not seem clearly to understand.

The sixth group, our own product, is surely coming to be recognized by the War Department, and by everybody else, as the mainstay of the whole officers' reserve corps plan. We can furnish the numbers—no other agency can. We found our discipline upon compulsory attendance—no other agency does. We give a properly graded course of instruction beginning at the bottom and progressing through the common physical drill to an orderly study of the higher branches, topped off by the graduate school of actual camp or army experience—no other agency does. We draw our clientelle from the whole Nation, geographically distributing the source of our army officers, as is correct in a national military plan—no other agency does. While it is true that the War Department and army officers in general in the past have had a shallow knowledge of, and no great respect for, the military work or the military possibilities of the Land-Grant Colleges, I predict with serene confidence that the day is to come when they will see that in this system is the greatest, almost the only, real dependence now in existence for building up an adequate Officers' Reserve Corps.

In the event the Land-Grant Colleges and other sources above mentioned do not furnish a sufficient and steady supply of reserve officers, what will be the next step? Many of you will remember the so-called McKellar bill, which has been in Congress for three years or more and which was seriously pushed at the last session. In brief, this bill provided for a chain of military academies, virtually West Points, one for every State, each to provide instruction for 400 cadets, the expense to be borne equally by State and Federal Governments. This plan has the merit of going squarely after what it thinks is needed. It has not commanded much of a following in Congress as yet, because Congress has never given our military policy much attention, and because the temper of our people has always deprecated any increase in military power. But the people are more awakened now than ever before. They begin to see the difference between aggressive militarism and rational steps for self-protection, and if, after trial, we fail to produce reserve officers in sufficient numbers to maintain a reserve of reasonable size, we may confidently look towards the McKellar bill, or some other of similar purport, being again put forward, this time with the people behind it. In short, I firmly believe that it is "up to us" to produce, or else to get out of the way of other more direct and more effective plans.

THE RESERVE OFFICERS' TRAINING CORPS

If an Officers' Reserve Corps is the necessity it has been represented to be, then some mode of training men to go into it becomes a necessary corollary. The War Department realizes this and Congress has ratified their judgment. The colleges of the country are to be entrusted with the task of training the men. Other sources are to be gladly utilized, in so far as they can do the work, but we are the ones upon whom the real work falls.

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The law provides for a relation into which institutions may voluntarily enter with the War Department, in effect a contract of indefinite tenure, which the institution may terminate at any time. No provision for termination of the relation is expressed in the law, but by turning in the governmental property and recalling the bond for the same, it would seem that the relation automatically ceases. This arrangement may have been necessary, in the case of schools like Harvard or Yale, which are under no obligation to enter into the plan at all, but in the case of the Land-Grant Colleges, founded in part to give military training, fostered for half a century by increasing federal grants, assisted by the appointment of officers and provision of equipment, why should they be given the option to go into or stay out of this plan? It is to be hoped that no such college will show ingratitude and lack of public spirit and refuse to establish a Reserve Officers' Training Corps. Some have already applied for admission without waiting to know definitely just what the new relationship implies.

What we get.—A study of the law shows that most of the weak spots pointed out before this Association in 1913 have been fairly covered. In the matter of increased instructional force in military science, the law now gives the Secretary of War authority to appoint as many army officers to teach in any qualified school as he sees fit, subject to the limitation of 300 active officers and 500 non-commissioned officers in total for school duty. The pro-rata distribution of officers and non-commissioned officers on the basis of the number of students under training was not retained in the final draft of the law, but there seems every indication that the general results aimed at under the pro-rata rule will be attained. It will be the duty of each institution to set forth its needs.

Great liberality has been shown in the matter of equipment. The Secretary of War may issue not only arms and equipment, but uniforms, means of transportation, animals for use of the cavalary and artillery, forage for animals and subsistence for men. The law places no limit in the amount of such supplies that he may furnish. There seems no reason, on the face of it, why the colleges should not draw complete equipment for field service in infantry, cavalry, artillery, signal service, engineer corps, and medical corps, so that students working in these respective lines could come measurably near to active service conditions, at least in familiarity with the equipment. The greatest advance of all, however, is in the recognition of the product of the training. Now, for the first time, can the student be shown the use and reason for the drill. For years past we have been requiring students to drill, while at the same time they knew that the training they were given was in a way discredited—at least, not recognized by the Army or the militia. Ten annual appointments to the Army have been the limit thus far, while the enrollment has mounted in recent years to 25,000 men under arms. For the average graduate of a Land-Grant College to get into the Army, the course to be followed hitherto has been exactly the same as if he had never seen a college nor drilled a day.

Under the new law, the student will be told that he must drill for two years, as heretofore, while receiving his education at public expense, because the country has an active need for men who have both education and military training. But to give point to the preceding statement, he can be told that if he shows taste for military work and shows mental and physical

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fitness for command, he can have the opportunity to go on to a responsible position in our military establishment, by taking two more years of the training in the senior division. He can be told that the Federal Government wants him to do this, and that he will be uniformed, given commutation of subsistence, transportation to and from camps, subsistence in camps, extra service uniform, and, at the end, will be eligible for a commission in the Officers' Reserve Corps. Lastly, to polish up his military knowledge and to consolidate his training and experience, he is encouraged to expect a commission in the army as a temporary second lieutenant for six months with pay of $100 a month and allowances before going into the reserve.

Since students have heretofore been found, usually in sufficient numbers, who have been willing to drill for a third and fourth year as cadet officers for the love of it, and with not enough compensation to cover the extra expense involved, it seems altogether likely that under the strong inducements now offered, many young men will be glad to undertake to do this extra work. The provisions of the new law seem highly advantageous to the colleges and to the students, but they naturally carry their quid pro quo.

What we must give. The colleges on their part, in order to take part in this national service, must find a way to fit this increased military work into their curricula. This can be done in two ways—both open to serious objections, and both demanding distinct sacrifices on the part of both faculty and students. These two ways may be characterized as the substitution plan and the special course plan.

The substitution plan.—This plan would assume that students, registered in agriculture, arts, engineering or any other college, would be permitted to take the reserve officers' training corps work, substituting the number of hours of theoretical instruction in that curriculum for an equal number of hours of required or elective subjects in their regular curriculum, and at the end receive the same degree as their classmates who have gone through the regular way.

Let us see just what this concession would amount to. The military curriculum of the Reserve Officers' Training Corps has been promulgated (General Orders 49, Sept. 20, 1916) by the War Department. It may be changed by the Secretary of War at any time that he is convinced that it needs changing. But changes, if any should be made, would only operate within the time requirements now given; they would not reduce the time demanded, as that is fixed by statute at three hours a week for the first two years and five hours a week for the third and fourth years. This curriculum demands the equivalent of two hours a week of physical drill ($^{16}/_{24}$) and one hour a week of theoretical work ($^{10}/_{24}$) for the first two years. Thus far, it is no increase in either branch over the requirements commonly in force in land-grant college military departments. It does demand a very considerable readjustment of content of the theoretical work; but that is not our immediate affair.

In the third and fourth years, the practical drill remains the same, except that the cadet now teaches the drill as an officer, instead of executing it as a private. The practical drill should therefore have the same weighting as before, or two credit hours. This leave a credit of three hours for the advanced theoretical work, and the published curriculum indicates that it is well worth it.

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The net increase in time for the new reserve officers' training corps course therefore is seen to be 12 credit hours, corresponding to 10 percent of the total credit for graduation in a standard arts course or about 8 percent of that in an engineering or other technical course. This work must be introduced into our curricula by substitution for other work now offered, for I think all college men will agree that the students are already loaded to the limit with work. Many teachers think we are now erring on the side of demanding too much of students, and that they are suffering from mental indigestion. This proposition is certain to arouse the opposition of some persons in every faculty. Faculties attach, rightly or wrongly, a very considerable importance to the exact composition and makeup of a curriculum. They will argue and quarrel for hours as to whether a half unit of one subject should not give place to a half unit of another. The exact adjustment of the proportions of linguistic studies, general cultural subjects, fundamental sciences, and technical applications of science is a source of perennial debate, and every department is on the qui vive to prevent any inroads on its own particular subjects. Coming into a situation already tense, with the bald proposal to cut out from 8 to 10 percent of the existing work, and to substitute an equivalent amount of work which faculties heretofore have been slow to recognize as of equal general value, it is easy to predict that opposition will arise.

On the other hand, such a proposition would not be equally onerous in all colleges. In agriculture, for instance, most curricula allow considerable room for general electives. It is possible to see that if military work were given academic credit and were used to fill in the electives, the agricultural student on graduation might have received instruction in all the fundamental work now offered and substituted 12 hours of military electives in place of a similar number of hours of non-technical electives.

In arts colleges, where the elective system is quite general, it is easy to see how military electives could replace other electives, without damage to the specific acquirements of the student. The function of an arts course is general training; not training for a definite professional purpose. It would not mean that the student who elected economics as his major need necessarily go out at the end of his course with less economics, but it would mean that his reading in other fields would necessarily be reduced in proportion as military credits replaced them.

In engineering colleges and other professional schools, the situation would be the most difficult. Engineering faculties believe that the exact amount and composition of their courses is vital. They are training men for specific ends. Every hour is directed to fortifying the student to meet a definite technical responsibility. One subject is not as good as another and the elective plan is not acceptable. To ask a young civil engineer to go out from school with no work in roads and streets, or sanitation, or advanced bridges or some other thing that he prizes as a means of getting a start in life, in order to introduce military electives, involves a serious sacrifice on his part. Further, the professor in civil engineering might object to granting the C. E. degree without these courses; and so in any other branch of engineering. They all think that four years is too short a time in which to produce the desired and expected degree of competence, under present conditions. The straight substitution plan, therefore, seems to work more hardship in some colleges than in others, and in general to work hardships in proportion to the technicality of the course.

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On the other hand, the outstanding argument for waiving our academic pride and accepting 12 hours of theoretical military work as credit towards a degree in any course is this:—the student is required to make the minimum sacrifice of his future professional plans, while still preparing himself loyally to give his government his service as a reserve officer. We must also not lose sight of the fact that the Nation vitally needs this Officers' Reserve Corps, and of the fact that we are the only source which can be depended on to meet this need. If we fail, the plan must fail, and recourse must be had to agencies still less in harmony with American ideals.

If the student can elect the military course and still win his degree in four years, he will balance the pros and cons as follows: "I get in money and in clothing about $100 a year; I get experience in handling men, in military engineering, and in living and taking care of myself in the open, all of which will be of undoubted value to me all my life; and I put myself in line to take my part in rendering service to my country in time of need. On the other hand, I must sacrifice some part of the thoroughness of my professional training or the breadth of my general education. Do the pros overbalance the cons?" I think that every year many hundreds of fine young men will answer "yes" to this question.

The special course plan.—If we do not look with favor on the substitution plan, we must turn to some form of course specially adapted to students with military aspirations. Of course this idea is capable of many variations. Three chief alternatives present themselves.

First, it would be possible to make the special course a purely military one designed to train men for a permanent military life. In this case we should be emulating West Point, with nothing but reserve appointments to offer our graduates.

Second, it would be possible to make this course a rigid general science course, leading to a B. Sc. degree, with military work as the strongly accented feature, but nevertheless a good solid course, which would serve a man well in almost any life he might ultimately choose. Such a course was formulated three years ago and adopted by the faculty of the College of Engineering of the Ohio State University, to be put in force at such time as sufficient military instructors to give the military courses might be available. That time has not yet arrived. For information I submit this course herewith.

FIRST YEAR

Mathematics (college algebra and trigonometry)	5	Mathematics (trigonometry and analytical geometry)	5
Chemistry (general)	4	Chemistry (qualitative analysis)	4
Foreign language	4	Foreign language	4
English	2	English	2
Engineering drawing	2	Engineering drawing	2
Gymnasium	1	Gymnasium	1
Military drill (as private)	1	Military drill (as private)	1
	19		19

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SECOND YEAR

Mathematics (calculus)	5	Mathematics (calculus)	5
Chemistry (qualitative analysis)	4	Chemistry (quantitative analysis)	4
Physics	5	Physics	5
Engineering drawing	3	Engineering drawing	3
Military drill (as non-commissioned officer)	1	Military drill (as non-commissioned officer)	1
Military tactics (instructor)	1	Military tactics (instructor)	1
	19		19

THIRD YEAR

Mechanics	5	Mechanics	5
Physics	2	Physics (electrical and mechanical laboratory)	4
Civil engineering (surveying)	5	Civil engineering (railway surveying)	4
Political science	3	Political science	3
Military science (art of war)	3	Military strategy	2
Military drill (as officer)	1	Military drill (as officer)	1
	19		19

FOURTH YEAR

Civil engineering (topographical drawing)	2	Geology	3
Civil engineering (topographical surveying)	3	Civil engineering (trusses)	3
Electrical engineering	5	Military law	3
Elementary law	3	International law	3
Military history of United States	3	Military science (commissary, transports and sanitation)	5
Military science (fortifications and entrenchments)	2	Military drill (as officer)	1
Military drill (as officer)	1		18
	19		

Summer shops at the end of the first year.

Summer session of six weeks' course in United States army training camps at the end of the second and third years.

Third, it would be possible to make the curriculum as slightly military as the requirements of the Reserve Officers' Training Corps would permit and as flexible and elastic as possible with wide general electives, so that students could follow as nearly as possible the course they originally entered, although unable to win the degree for that course.

Of these three alternatives, I favor the second as having the most merit; but it would be much more difficult than the others to apply, because students who started in literary courses and wanted to change could not do so for lack of foundation in general science and elementary engineering which such a course would require. The second alternative would work without hardship for colleges of engineering, but only for them. The third alternative is the easiest of the three to apply but it is objectionable in that

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perhaps it might be looked upon as a "snap" course, which students might enter in order to escape the asperities of the regular courses. Furthermore, it does not insist on the training for a reserve officer, being made to include certain fundamentally useful things outside of purely military subjects.

The objection to any and all of these special courses is that they increase the sacrifice which a student must make in order to qualify for the reserve. They give him a degree of a non-distinctive character for his four years' work and on the other hand, are not able to offer him a profession in the military line. It should be remembered that the reserve presupposes that its members will earn their living as other citizens do and only yield to the Federal Government a small fraction of their time, except in case of war. Consequently, the price of becoming a reserve officer cannot be made too heavy without defeating the whole purpose of the plan.

SUMMARY

First. The great European war has forced the American people to think more seriously than ever before of their military policy, and while still at heart as antagonistic as ever to what they conceive to be militarism, they are now willing to consider under the head of preparedness for defence programs that heretofore would not have had the least chance of adoption.

Second. Preparedness in a military sense, while including many things, rests more upon the number and competence of its leaders than upon any other factor.

Third. Congress has recognized this situation by doubling its establishments at West Point and Annapolis, and by creating elaborate provision for enlisting and maintaining an Officers' Reserve Corps for both branches of the service.

Fourth. Men of proper education and proper military experience for these reserve corps are pitifully few. The supply must be secured to young men of proper antecedents and proper education by giving the necessary special training.

Fifth. Since appointments in the reserve corps are not pecuniarily attractive, and only appeal to men of patriotic instincts and high ideals of civic responsibility, the requirements to qualify in this service cannot be made too severe without defeating the principal end in view.

Sixth. The only source of men of the right caliber and in sufficient numbers, is in the institutions of higher learning, and chiefly in the Land-Grant Colleges, which were founded in part to do this very thing, and have been doing it for the past 50 years as well as they could, considering the bungling and ineffective legislation under which they have operated.

Seventh. In order to produce large numbers of men of sufficient military efficiency for reserve purposes, it is necessary that the Land-Grant Colleges seriously address themselves to this problem, and adopt a policy of encouragement towards the plan, even at some inconvenience to themselves, and at the price of some sacrifices of their efficiency in the other work which they have been organized to do.

Eighth. The one serious difficulty the schools will find is in determining how to deal with military credits, to the number that the law provides, in courses already filled to the limit without them.

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Ninth. Two plans are proposed—one substituting military credits to the number necessary (in no case exceeding 10 percent of the course) in any course, leading to any degree, in place of electives if there are any, and in place of required work if there is no other. The other plan creates special courses of one sort or another, into which candidates for the Officers' Reserve Corps would go for completion of their work.

Tenth. The first plan is favored by the writer, for the reason that it encourages students to join the reserve corps while also encouraging them to obtain the largest professional competence, or the broadest education consistent with this object.

Eleventh. The second plan is condemned by the writer, because it penalizes the patriotic student who wishes to go into the Officers' Reserve Corps, either by giving him a nondescript degree or requiring him to spend extra time to win the degree for which he entered.

I therefore propose the following resolution for the consideration of this Association.

(See page 141 for text of resolution adopted in advance of the reading the paper).

THE PRESIDENT. We are fortunate in having with us this morning Maj. Andrew Moses of the General Staff of the War College, who will continue this discussion.

MAJOR ANDREW MOSES. I fear I shall not be able to answer some of the questions that may be asked me because this whole matter is as yet in the formative stage. The reserve officers' training corps section of the law represents the efforts of the War Department, assisted by the active aid and advice of the Executive Committee of this Association to present to Congress recommendations for legislation that would do the most good towards creating a body of trained reserve officers. Following the enactment of that law, it was necessary to formulate regulations putting it into effect as quickly as possible, in order that something definite might be placed in the hands of college executives so that they could get to work this year. Unfortunately army printing is not always done as rapidly as desired, and these regulations were not issued as soon as expected. They were prepared in July and it is probable that there may be provisions found in General Orders No. 49 that will require some amendments, or that can be improved upon. The War Department is anxious to adopt any feasible measure which seems likely to make more certain of accomplishment the end we all have in view.

The Secretary of War and the Chief of Staff desire to remedy promptly any defect that may be found in the regulations, or to call the attention of Congress to defects in the organic law. But in the meantime you must bear with the regulations in patience, appreciating, as I am sure you do, that we are all working for the same thing, namely to produce trained reserve officers for service in case of war. It has been brought home, especially by the European war, that our country should have at least 50,000 reserve officers. The War Department thinks that one of the best sources for obtaining men for the Reserve Officers' Corps is our colleges and universities; and the backbone in this system, it believes, is the Land-Grant Colleges. The regulations have been based on their experiences for 50 years in work along these lines. We believe that these institutions will be our most dependable source for obtaining these officers. We hope that

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all educational institutions of collegiate grade will adopt this reserve officers' training corps plan. Any or all of them complying with its necessary requirements can organize to that end. The gate is open, the opportunity is offered, the War Department wants them. It hopes that our college graduates will become leaders of our war armies, as they are becoming leaders in civic affairs. That is certainly a consideration of the first magnitude, of the greatest desirability that we thus get our educated men as leaders. They naturally will be leaders in civil life, and if we can make them leaders in military life as well, much will have been done for the protection of our country. If we have the trained officers we can train our men much more rapidly; but if you have not the officers, and the blind are leading the blind, it is a hopeless task when war is declared.

It is greatly to the advantage of the adopted system that it is based on the fact that it makes use of existing agencies, and the cadet units as they now stand, organized under the provisions of Section 1225, Revised Statutes.

Under the new law and regulations for the Reserve Officers' Training Corps there are many reasons to expect very much better results than under the old system; for example, we may mention:

(*a*) Heretofore in many cases the student has felt that his military training lead to nothing and that there was no certainty that he would be given a commission in case of war. Now it will lead to a commission in the Officers' Reserve Corps, if he desires it, and to an appointment for six months as a temporary second lieutenant in the Regular Army with the allowance of that grade and pay of $100 a month.

(*b*) Heretofore the student has been put to the expense of providing his own uniform; hereafter the Government will furnish his uniform. It is, however, permissible for colleges having a gray or blue uniform to continue to use it, or to adopt, at their own expense, full dress, dress or fatigue uniforms. The Government will furnish only the olive drab service uniform which will no doubt be needed for field instruction.

(*c*) Whereas, heretofore, one officer has had to instruct as many as 2,000 students in one institution, five or six officers and some 15 non-commissioned officers when available may now be detailed to such an institution. I use the words "when available," because just now there are a great many vacancies in the grade of second lieutenant. The War Department is anxious to have young college graduates compete for these appointments. Until these vacancies are filled, the army will be short of officers. On account of the mobilization of the National Guard, it has been impossible to supply as many instructors for the Reserve Officers' Training Corps as the War Department hopes to be able to supply later on. An adequate corps of instructors should be able to make the instruction both thorough and interesting, where heretofore, in some cases, it has been perfunctory.

(*d*) Whereas, heretofore, only ordnance and ordnance supplies could be issued to an educational institution, the law now permits the issue of "public animals, arms, uniforms, equipment, and means of transportation, and to forage at the expense of the United States for public animals so issued." This will permit the holding of camps and practice marches and will add greatly to the interest of the course.

(*e*) Heretofore at many institutions very few students have elected to continue military instruction after completing the required two years. Now those who elect and are selected to continue in the Reserve Officers'

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Training Corps during the remainder of their course at the institution may receive commutation of subsistence. This, amounting to about nine dollars per month, will be equivalent to a substantial scholarship and afford a great inducement to a large percentage of students.

(*f*) Heretofore the military instruction has been very largely composed of drill on the college campus. To this will be now added under the new system:

(1) More theoretical work during the junior and senior years.

(2) Practical field and camp training during at least two summer camps of four weeks each and such short camps and practice marches as can be had during the academic year.

(3) Six months' training may be given with the regular army for those who desire the appointment. It is hoped that Congress will appropriate sufficient money so that the majority of these young men may be able to take six months' training in the Regular Army, where we hope they will learn the regular army methods and discipline, and become better equipped for actual service.

COURSE OF TRAINING FOR SENIOR UNITS OF THE RESERVE OFFICERS' TRAINING CORPS

The regulations for the Reserve Officers' Training Corps (General Orders, No. 49, War Department, 1916), contemplates that the complete course of training for a member of a senior unit of that corps shall include:

First. *The Basic Course.* Military drill and instruction for three hours a week during the freshman and sophomore years.

Second. *The Advanced Course.* Five hours a week during the junior and senior years. Not compulsory, but substantial inducements are offered students to take the course. They will act as officers and non-commissioned officers or instructors, under supervision of the professor of military science and tactics, in giving the basic course instruction to freshmen and sophomores for three hours a week. During the remaining two hours a week they will receive theoretical or classroom instruction from the professor of military science and tactics and his assistants.

Third. *Camp Training.* Two camps of four weeks each. Normally one will be taken at the end of the junior year, and the other subsequent to graduation, but credit will be given for camps taken during the basic course. In order to draw commutation of rations during the junior and senior years, students must agree in writing to take these two camps. Students who have completed the basic and advanced course and two summer camps work satisfactorily are eligible for a commission in the reserve officers' corps.

Fourth. *Six months with Regular Army.* After completing the basic course, advanced course, and camp training, the graduate may be commissioned in the officers' reserve corps, and, in addition, then appointed temporary second lieutenant in the Regular Army for six months.

STANDARDIZATION OF MILITARY INSTRUCTION

The endeavor has been made to standardize the courses and methods of military instruction at educational institutions so that the graduates may be up to the standard as far as practicable for officers of the Regular Army, and this object has been sought in laying down the course of military instruction to be followed by students with a view to their becoming reserve officers. The prescribed training has been made largely practical so that

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they may be ready to perform their duties at once when needed. The graduate of one of our colleges or universities has received a high degree of academic education, and the War Department need have nothing to do with this part of his training. Every effort should be devoted to giving him a practical knowledge of his duties as a company officer. The regulations governing the Reserve Officers' Training Corps contemplate that the student will be given a special course of military training, commencing with his first year in college and ending with a period of service with a unit of the Regular Army. The end in view should be bringing these graduates to the approved standard of military efficiency.

CONCLUSION

At the last annual inspection of the military departments of the Land-Grant Colleges there were 27,746 students under military instruction in these institutions. It is beljeved that the provisions of the new law will serve to increase this number to 50,000 within three or four years and that about 10,000 of these will be pursuing the advanced course. We may therefore expect that within a few years the Land-Grant Colleges will be graduating annually some 5,000 young men who have completed the standardized full four years' course in the Reserve Officers' Training Corps, and are thus eligible for commission in the Officers' Reserve Corps and for six months' appointment in the Regular Army for additional training. It is therefore evident that the Reserve Officers' Training Corps will serve as one of the most important agencies for training young men to become officers in the Officers' Reserve Corps.

THE PRESIDENT. The secretary has a resolution to present.

THE SECRETARY. The secretary is asked by the Chairman of the Executive Committee to represent that committee and to read this resolution, which is pertinent to the matter in hand:

"*Resolved*, That the Association of American Agricultural Colleges and Experiment Stations, in session November 17, 1916, expresses its appreciation of the importance of the Reserve Officers' Training Corps portion of the National Defense Act. In the successful operation of this measure the Land-Grant Colleges are deeply interested and the Association declares its purpose to cooperate heartily with the War Department in securing a successful administration of this measure. The Association urges upon the Honorable Secretary of War the importance of adequate appropriations by Congress in support of the measure.

Resolved further, That the secretary of this Association forward a copy of this action to the Secretary of War."

On motion, the resolution was adopted.

THE PRESIDENT. The committee appointed to prepare a minute in respect to the death of Director J. H. Kastle of Kentucky is ready to report.

H. A. MORGAN of Tennessee. The committee presents the following resolutions:

Whereas, This Association has received with the deepest regret information of the death on September 24, 1916, of Doctor Joseph Hoeing Kastle, Dean of the College of Agriculture and Director of the Agricul-

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tural Experiment Station of the State University of Kentucky, therefore be it

Resolved: That in the death of Doctor Kastle in the prime of life and in the midst of a useful career, this Association has lost a valued member; the science of chemistry one of its most able investigators and teachers; agriculture an exponent of unusual breadth of view; and the scientific world in general a worker conspicuous for his tireless energy in the prosecution of his work and a master in the presentation of the results of his labor.

Be it further resolved, That in commemoration of our respect and appreciation, these resolutions be spread upon the minutes of the Association.

A. M. PETER,
GEO. ROBERTS,
H. A. MORGAN.

THE PRESIDENT. I suggest that your approval of this resolution be manifested by a rising vote.

The resolution was thus adopted.

THE PRESIDENT. Nominations for officers of the Association for the ensuing year are now in order.

B. PRILLERMAN of West Virginia. I place in nomination for president of this Association the name of K. L. Butterfield of Massachusetts.

The nomination being seconded, on motion, the secretary was instructed to cast one ballot for K. L. Butterfield of Massachusetts as president for the ensuing year; and he so cast the ballot.

Other officers were elected in similar fashion as follows: Vice-presidents, C. A. Lory of Colorado, Brown Ayres of Tennessee, J. L. Coulter of West Virginia, C. A. Duniway of Wyoming, W. B. Bizzell of Texas; secretary-treasurer, J. L. Hills of Vermont; bibliographer, A. C. True of Washington, D. C.

Reports were made by the nominating committees of the sections as follows:

College section—For chairman, C. C. Thach of Alabama; for secretary, A. F. Woods of Minnesota; for program committee, the chairman and secretary; for members of Executive Committee, W. O. Thompson of Ohio, H. J. Waters of Kansas, R. A. Pearson of Iowa.

Engineering division of the college section—For chairman, W. H. S. Demarest of New Jersey; for secretary, A. A. Potter of Kansas; for program committee, the chairman and secretary.*

Home economics division of the college section—For chairman, Josephine T. Berry of Minnesota; for secretary, Helen Knowlton of New Hampshire.

Station section—For chairman, R. S. Shaw of Michigan; for secretary, W. M. Jardine of Kansas; for recording secretary, W. H. Beal of Washington, D. C.; for program committee, the chairman, secretary and recording secretary; for members of Executive Committee, W. H. Jordan of New York, H. L. Russell of Wisconsin.

*For officers of the Land-Grant College Engineering Association, see footnote, p. 239.

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Extension section—For chairman, R. K. Bliss of Iowa; for secretary, C. R. Titlow of West Virginia; for recording secretary, C. B. Smith of Washington, D. C.; for program committee, the chairman, secretary and recording secretary.

On motion, the nominations by the several sections of chairmen and secretaries were approved.

On motion, the general session of the Association adjourned *sine die*.

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MINUTES OF THE SECTIONS

SECTION ON COLLEGE WORK AND ADMINISTRATION

AFTERNOON SESSION, WEDNESDAY, NOVEMBER 15, 1916.

The section was called to order at 2 p. m. by the chairman, A. R. Hill of Missouri.

THE CHAIRMAN. In view of the fact that the paper before this section by Professor L. R. Jones of Wisconsin, on "Graduate Teaching and Its Relations to the Work of the Agricultural Experiment Station" is very closely akin to the paper on "Employment of Research Assistants Who May Register as Graduate Students at the College," by Director J. G. Lipman of New Jersey, listed in the program of the station section; and also, in view of the fact that it is desirable to have these papers simultaneously discussed; I have taken the liberty of inviting the station section to sit with us in joint session.

Director Lipman will now present his paper,

EMPLOYMENT OF RESEARCH ASSISTANTS WHO MAY REGISTER AS GRADUATE STUDENTS AT THE COLLEGE

BY J. G. LIPMAN

The federal appropriations to our agricultural experiment stations reached their maximum several years ago. For this reason, further expansion of the work supported by these funds is no longer expedient In other words, the average station director must consider the budgets of the Hatch and Adams funds as fairly definite and rigid, except in so far as the investigation of some projects has been completed and new projects are being planned to take their place. Under these conditions, the station director is, naturally, interested in all schemes of organization which may lead to economy of expenditure without lessening at the same time the effectiveness and value of the research and experimental work. It is proposed in this paper to discuss the employment of graduate students as research assistants, partly because of the economies which may be effected in the conduct of research work and partly because of the training and opportunities which the proposed organization may offer to the students themselves.

There has been a marked tendency of late years to group the research and experimental work of our stations under definite projects. As is well known, the Office of Experiment Stations has encouraged such grouping. It is not the purpose of the author of this paper to discuss the advantages and disadvantages of the project system. He merely wishes to point out that, under the project system, graduate students may find a place all the more readily as research assistants.

The objection will be raised, of course, that graduate students could not —and perhaps should not—be depended upon to plan and carry out important experimental work. When this objection is conceded, it still remains true that important research may be so planned and arranged by the head of a department or division as to allow of the effective study of entire problems or portions of problems by properly selected research

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assistants who but recently completed their undergraduate training. By way of illustration, one could mention the compilation of bibliographies, the preparation of experimental material, the recording of routine observations, the performing of routine analyses and the tabulation of data as tasks that would be performed satisfactorily by beginners in research work. Much of the research work in plant and animal nutrition, plant breeding, plant pathology, soil biology, etc., could thus be provided for at a minimum cost without depreciation in quality. Specific examples could be given without difficulty. Perhaps one such example would serve the writer's purpose. Among the problems in the department of soil chemistry and bacteriology of the New Jersey Agricultural Experiment Station is one dealing with factors that concern the availability of nitrogen in different nitrogenous plantfoods. These factors are rather numerous and include the chemical and mechanical composition of soil, soil reaction, range of soil moisture, range of soil and atmospheric temperatures, type of crop, length of growing season, thickness of stand, character of the mineral fertilizers applied, etc. In carrying on these experiments, either by means of small pots, cylinders or field plots, there is, of necessity, much routine work to be performed. The plant food used must be weighed out in definite amounts and must be applied in a definite way. The planting, cultivation and harvesting of the crops involves much work of a routine character. In the case of pot and cylinder experiments, definite quantities of water must be added from time to time. Records must be made of the appearance of the crops as affected by the different treatments. The crops, on being harvested, must not only be weighed, but must be dried, ground and prepared for nitrogen determinations. It is obvious that much of this work can be readily assigned to research assistants. Moreover, where the individual assistant possesses enough initiative and adequate preparation, problems of a more or less original character may be assigned to him. In plant breeding, research assistants may be entrusted with the study of certain crosses. In soil biology, they may be entrusted with the isolation and the study of species of soil organisms. In plant pathology, disease organisms may be studied, isolated and described or methods of control may be compared. It would hardly be necessary, therefore, to give other examples toward the support of the claim that an experienced investigator may so arrange his research problems as to permit the utilization of the services of beginners in research work, provided they possess the right temperament and training.

Any research problem of considerable magnitude could be subdivided in a manner to allow the cooperative study by a number of research assistants. This fact has evidently been well appreciated by leading teachers and investigators in Europe, who have utilized the services of graduate students for the study of broad fundamental problems. In some instances graduate students have not been permitted to grasp the meaning of the entire problem of which their particular work forms a part. Most of us would not approve the limiting of the assistant's enthusiasm and understanding. Whenever he is only one of several contributors to a research project, he should be encouraged and helped to understand the entire project in all its bearings. This should be done for his own sake as well as for the sake of the investigation itself. But, whatever the arrangement and subdivision of the work among several research assistants, it is obvious that the system discussed in this paper, if it is to give profitable returns,

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hinges on the training, mental grasp and organizing ability of the investigators in charge. The system is likely to break down if the research problem is not very carefully analyzed and so subdivided as to make portions of it safe to entrust to research assistants. This point may be made clear by the following instance. Let us assume that it is proposed to study the environmental factors which may affect alfalfa production. Even a superficial analysis of the problem will show us that among these environmental factors we should include soil type, drainage, soil reaction, the composition and amounts of lime to be used, the nature and amounts of mineral fertilizers to be applied, inoculation and methods of inoculation, the source and quality of seed to be used, methods of seeding, after treatment of the crop, harvesting and curing. Other environmental factors, such as the amount and distribution of rainfall, air currents, direct and diffused sunlight, soil ventilation, competition of weeds and other pests could be mentioned as falling within this particular problem. The investigator in charge of the entire problem would, if he were wise, restrict himself to the study of but few of these factors at any one time. If the number of assistants be large enough, the study of a larger number of factors could be attempted. Even then, he would so arrange the work as to enable him to study related factors so that the work of one assistant may contribute suggestive facts to the work of another. If the system be followed to its logical conclusion, we may come to consider consulting investigators a desirable addition to our scheme of experiment station research. The writer has believed for some years that two or more stations engaged in the study of the same or related projects may cooperatively employ leading specialists in any given field of research.

In the employment of graduate students as research assistants, it is fundamentally important to secure the services of young men who possess not alone adequate technical training, but also the temperament without which success in research is impossible. We all know that the personal equation in research is one of the major factors.

Among the characteristics which enter into this personal equation, one might mention a true zeal for research, a critical attitude toward theories and facts, a certain analytical tendency of mind and industry above the average. Evidently, letters of recommendation would be far from adequate for enabling the head of a department or division to decide whether any particular candidate would be acceptable. A scholarship record is in itself insufficient. Personal acquaintance with the candidate is essential in almost all cases. Many of us would give preference to candidates whose training may be limited in some direction but who possess the right temperament. Indeed, the matter of personal equation could hardly be overemphasized. It is largely because of the advantages which the graduate student possesses in this direction that he is so desirable as a research assistant.

At the New Jersey station the research assistants, who are also graduate students in the college, are employed on the half-time basis. Their time is thus divided equally between graduate study and station research. They are paid at the rate of $600 per annum and are permitted to present themselves for the master's degree at the end of two years and for the doctor's degree at the end of four years. The employment is for the calendar year, but a vacation of one month is allowed within each year. Full opportunity is offered to the young men to use the apparatus, library and other equipment. The major and minor subjects of study are so arranged as to pro-

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vide for as fundamental a training as may be offered at the institution. Under the conditions just noted, the institution is able to secure the services of young men far superior in mental caliber and training to ordinary assistants who would be content to serve for $50 or even $75 per month. The experience at our station shows that the graduate students employed as research assistants possess a mental keenness and zest which are gratifying in the extreme. They seem to display much initiative and inventiveness in the study of the problems assigned to them.

There are at present regularly employed at the New Jersey station nine research assistants, aside from the two or three other graduate students who are employed in a more temporary character. They are given much latitude in the arranging of their graduate work. Thus, while college instruction is in progress, they may be allowed to devote somewhat more than one-half of their entire time to graduate study. On the other hand, during the summer months all of their time may be available for station service. The problems assigned to them as a part of the station work are correlated in so far as possible with the problems which they must study as graduate students. They are encouraged to discuss their work not alone with the head of the department to which they are attached, but also with other members of the staff who may be in a position to offer them helpful hints. Our graduate students have organized a graduate students' club, and they meet regularly to discuss one anothers methods and results.

Since the adoption of the plan discussed in this paper, the quality of much of our research work has improved. There has been a gain to the institution and there has been a gain to a number of young men who are preparing themselves for service in agricultural research. It is because of the results secured at the New Jersey station that the writer of this paper feels encouraged to call the attention of other station directors to the possible benefits which may be derived from the system at other institutions.

THE CHAIRMAN. Professor L. R. Jones of Wisconsin will now present his paper dealing with "Graduate Teaching and its Relations to the Work of the Agricultural Experiment Station."

GRADUATE TEACHING AND ITS RELATIONS TO THE WORK OF THE AGRICULTURAL EXPERIMENT STATION

BY L. R. JONES

Doctor Lipman has clearly presented the facts and reached the logical conclusions from the standpoint of the station director who is seeking to get the largest return in the way of "investigation" for the money he pays out. He has also well emphasized the important points to be borne in mind by the administrator who is seeking the mechanical assistance of the "project" plan in the organization of his forces. I believe that, so far as relates to these matters, he has stated the facts correctly and reasoned soundly. Therefore, I heartily concur in his conclusions, that the most economical investment that can be made of a certain portion of experiment station funds is in such employment of graduate student research assistants. I have been doing it in my own research work in plant pathology—first in Vermont and later in Wisconsin—every year for 18 years, and am satisfied and have always been able to satisfy my directors that in economical

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investment of experiment station funds it "pays." Indeed, I believe this system is to some extent already in use in most of the agricultural colleges where master's degrees are being awarded. I believe, therefore, that Dr. Lipman's chief points will be accepted without debate.

Assuming, then, that this system is accepted as administratively economical and from that standpoint sound, I wish to make my personal contribution to the discussion from the point of view of the teacher whose chief interest is in the graduate student. What are the advantages and what are the possible dangers attendant upon this system?

In this discussion I shall assume that all are agreed upon two points which I shall here state as basic to our discussion.

The two most important functions of the teacher in relation to the graduate student are:

First. The selection of the men, or, more properly, the aiding of the men wisely to choose their own profession.

Second. The teaching of the men, or, again more properly, the placing within reach of the men the means of their own education.

Please note that in each of these the important part which the teacher plays is not in doing the thing for the student, but in helping him wisely to do the thing for himself. The final choice of career of every young man should be self made—and every man who is really educated is self educated; but for the best results with both of these things the student needs breadth of opportunity, and freedom from undue influence, especially such influences as are linked with financial considerations. What is the bearing of the regular offering of such "experiment station fellowships" upon these two points?

First. As to the selection of men, aiding them in the choice of a profession. I think it is at once a commendable thing and subtly dangerous. We may all agree that any such help that makes possible the higher training of our best types of research students is desirable. But do we not need to recognize that in this or any other financial offering which influences immature students to start upon research as a profession lurks the danger of attracting the weaker more than the stronger men? We need to stand guard most jealously as to the men admitted, both for their own sake and for the standards of the profession. Everyone who has followed the development of our experiment stations through their earlier years knows how many "misfits" there were. A man who may be most happy as a teacher or a man of affairs may be unhappy as an experiment station investigator. While we should, therefore, be most zealous in our search for the right man, the "born investigator," we should be equally careful not to tempt or bribe the unfit. Herein lies the first serious danger in such employment of graduate students. Can we always keep it clearly in mind when selecting from among them our experiment station assistants?

Second. As to the environment and courses needed for the best results in graduate study. Remember we are now trying to consider only what is best for the student, not what is economical for the experiment station or helpful to the department. Let us assume that, in general, we are considering the case of a student who has already spent four years as an undergraduate in the agricultural course of the state college and it is now the question whether it is best for him to remain at the same institution two years longer and take his master's degree, or, perhaps, as suggested in the

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New Jersey plan, four years longer for his doctor's degree, meanwhile earning his way by assisting in the experiment station work. As adviser to such a student what shall we say? So far as I can safely discuss the case as a general proposition, my suggestions might coincide with these. It is probable that such a student as an undergraduate has already nearly exhausted the regular courses in his major line in the agricultural college. If so, he will find his chief opportunity in regular course studies, in related sciences and in further language studies. Probably in nearly every case there will be enough of this of good educational value to occupy the one-half time allowed him for such work. The other half may be given to assisting on the experiment station problem. If there is inspiring and congenial leadership in this, with the well-organised plans advised by Doctor Lipman, I believe that from the educational standpoint one year may profitably be spent in such relation. Let us assume, however, that this is the student's fifth year on the same campus and that this year has served its most useful purpose educationally, which is by trying him out in these higher studies and research work, to prove to the student and to his faculty advisers that he has the right stuff in him for a professional career. If he shows this capacity, what are we to say to him at the end of that year? Shall he remain a sixth year and perhaps continuously a seventh and an eighth year in the same laboratory and receive his doctor's degree from the same institution that gave him his bachelor's and his master's diplomas? And shall he do this, working under an eleven-months' engagement which does not even provide for a summer session at some other institution? Is it by this method that we are to give men the adequate training to keep agricultural science not merely abreast of the sister sciences, but, as we should, in the lead in research work soundly based on fundamentals? For such a student who has spent five years on the campus, my advice is, as a rule, to migrate. Certainly if he has spent six years there and has taken his second degree, it is clear to me that he should not be encouraged, even if he is allowed, to proceed uninterruptedly as a candidate for his doctorate. Think what he may gain! The stimulus of a completely changed environment! A fresh library, a different laboratory, a new set of scientific associates, another departmental leader and adviser! We may be justly proud of the relative advance of American universities during the last decade; we may especially congratulate ourselves that this advance came before the present European crisis closed to American students the doors to the European universities where formerly so many of our present leaders finished their training. We may say with justification, I believe, that hereafter no American student—at least in the sciences fundamental to agriculture—need leave America in order to find the best in graduate opportunity as represented in library, laboratory or personal leadership. But granting to our American colleges all these riches, may there not be as with the young man of old, still one thing lacking for our educational salvation? Are not our American students, and indeed our American colleges, as compared with the best types of European university and European student, living intellectually, as we are geographically, in comparative isolation? Are we not somewhat provincial? The rapid institutional growth, especially in the agricultural colleges, has almost compelled the recruiting of our departmental staffs from among our own graduates, even though all recognize the dangers of such "inbreeding." Has not our American "college spirit" with its loyalty to "Alma Mater" spread from its legitimate

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undergraduate sphere to influence our graduate schools? Are we, in our American colleges, making graduate student migration the easy, natural, and expected thing? While recognizing the "rolling stone" disadvantages of too frequent translocation, especially as affecting laboratory problems, we must all agree that our American graduate students need to migrate far more freely among our schools than they do. In my judgment, practically every candidate for the doctor's degree, who is being held by an institution for three or more years of resident work, should be expected to spend at least one semester at another institution, and in general two would be better. Moreover, at least until such migration becomes as much the habit among American students as it is with Europeans, does not the responsibility rest with us as teachers and administrators to stimulate and advise this as far as possible?

Of course, this plan for graduate student research assistance does not necessarily result in the retention of the students from that same institution. Perhaps most administrators would prefer the employment of men from other colleges. But in practise the inevitable consequence is that, in many cases, the best local man is selected. He is personally known, often directly prepared by undergraduate training, and immediately available. Let us remember then that in this composite relation of teacher, adviser, and employer, we are not justified in leaving the decision wholly to the student. We must not use our experience, as pitted against his inexperience, in any other than the most wisely helpful manner.

In conclusion, I would then commend the employment of graduate student experiment station research assistants as being economically wise from the standpoint of efficient station administration. At the same time from the other standpoint, that of the teacher aiming to conserve the best educational interests of the student preparing for professional work, I would earnestly caution against the employment of graduates of the same institution continuously for a period of more than one year or, at most, two years immediately following graduation. I would emphatically discountenance any policy that contemplates such continuous employment leading up to the doctor's degree. Our agricultural professions need and deserve recruits trained in the broadest and best way, and such a method fails to meet these standards.

A. F. Woods of Minnesota. After six years' experience with a hybrid of these systems—perhaps more nearly the one suggested by the last speaker than that referred to by Doctor Lipman—we feel in Minnesota that we have distinctly gained both in the graduate school and in the station. The warning that Professor Jones has given us is timely. We should urge our students to leave us. There is great danger in keeping them too long; but from the standpoint of the station we find occasionally that it is necessary to hold a man in order to complete a project. We cannot, as station directors, permit work to be left partially finished; on the other hand from the standpoint of the graduate school the project should be so shaped that it can be completed within a reasonable time. We have sometimes found it necessary to hold a man for three years. We have, I believe, 18 such men at work.

J. G. Lipman. May I say, as supplementary to what I said, that I believe no Rutgers alumnus is now employed as a half-time research as-

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sistant. We also recognize the danger of inbreeding, and we advise migration.

A. B. Cordley of Oregon. We adopted the policy in Oregon of hiring graduate students as assistants ten years ago this fall. At first as a matter of necessity we employed our own graduates, but through a process of evolution which appears to have followed the correct lines, during the last few years we have, whenever possible, employed graduates of other institutions. This procedure has been found to be economical and advantageous from the standpoint of both employees and employer.

The Chairman. Is it the practice to allow credit towards a degree for the work done for the station? Evidently not, from the fact that it takes two years to get a degree.

J. G. Lipman. It is not, but the station has the services of an assistant for the full time, in so far as his thesis work is accepted and acceptable as station research. In so far as the student himself is concerned, he is expected to devote fully one-half of his available time to his own studies and research.

H. L. Russell. Doctor Jones has called attention to the fact that unfit graduate students may be selected for this work. It seems to me that the director, either personally in his relations with his staff or through the departmental heads, should guard against such a danger. I believe that it is possible for us to get a considerable body of young men who are fit, and who, while they are not trained, are on the road to better training. This problem will be of more importance in the next ten years than it has been in the past, for the reason that the training of men who are entering station work is constantly getting on a more fundamental basis. Four years of undergraduate instruction are altogether inadequate as a foundation for scientific work.

I think that Doctor Jones struck the keynote with reference to the question of migration. We will not employ a Wisconsin graduate in a professorial capacity until he has gained experience elsewhere. We may carry a graduate in a subordinate capacity as an assistant or an instructor, or half-time relations may be established with him which will permit his beginning graduate work in the institution, but if he aspires to become a permanent member of the staff we insist on absentee work.

Some of the best research work by our younger men has been done by student assistants under immediate direction. Of course, the ordinary baccalaureate candidate cannot begin a piece of independent research work; but where the work is done in close connection with the departmental head it is possible to give him a piece of research work which has its economic relations so far as our state problems are concerned, and which at the same time may adequately serve to introduce him into a piece of graduate research, the results of which ultimately may lead to the fulfilling of the degree requirements.

Doctor Lipman has raised the question as to the time that should be required before a man should secure these higher degrees. I believe he mentioned two years for the master's degree and four years for the doctor's degree. We must be very careful in giving the students any idea in regard to a definite time-limit with reference to the securing of degrees. It should be not a question of the fulfillment of a time requirement, but a question

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of the character of the work performed; and while it is entirely possible that two years' time might suffice to satisfy the requirements with reference to the master's degree, which only requires one year of graduate work, it is questionable whether it is wise to allow the student to understand that four years in this quasi-official relation, in which only a portion of his time could be spent in research work, would be sufficient to permit him to secure the doctorate.

H. E. VAN NORMAN of California. We separate the financial and the educational rewards. A man cannot work for both at the same time on the same piece of work. If he is a candidate for a degree, well and good. On the other hand, some departments need part-time assistants. If a student wants to do post-graduate work and to work, let us say, four hours a day for a stipulated wage, the departmental head and the student may do business, separating the financial reward and the educational reward.

The joint session then adjourned and the college section as such continued in session.

THE CHAIRMAN. The Chair appoints as nominating committee President W. M. Riggs of South Carolina, Dean H. L. Russell of Wisconsin, and Chancellor Samuel Avery of Nebraska.

I take pleasure in introducing Dean W. W. Charters, of the School of Education of the University of Missouri, who will speak on the subject, "Methods of Improvement of Teaching in Colleges of Agriculture."

METHODS OF IMPROVEMENT OF TEACHING IN COLLEGES OF AGRICULTURE

BY W. W. CHARTERS

It requires resolution for a man who professedly knows nothing about agriculture to appear before a group of specialists in that subject and talk to them upon methods of improving the teaching of their own subject. I should not presume to do this were it not for the fact that last summer I spoke before the Graduate School of Agriculture for five days, and during that time, although I was speaking upon the subject of general methods of teaching and not on methods of teaching agriculture, I discovered the interesting fact that the problems which seem to be troubling the professors of agriculture in connection with the teaching of their subject were exactly those which were troubling other teachers in other subjects. Consequently, because of the similarity of problems, I consented to talk here upon the subject of methods of improvement of the teaching of agriculture.

When we consider the improvement of the teaching of any subject, there are two fields which differentiate themselves at once. Those two fields are (first) the field of outcomes or functions of teaching, and (second) the field of methods of teaching. In connection with the first, it is very easily possible that our teaching of a subject might be ineffective because our idea of the outcome of the subject is wrong. We may, therefore, improve the teaching of the subject by changing the idea of this outcome. For instance, a vocational school may have a very narrowly vocational attitude towards the vocation to be taught. The outcome as a result will be that of training its pupils specifically and narrowly. Now, it is possible for us to change the attitude, or ideal, and thus to make our teaching more efficient, if we believe a narrow vocational ideal to be wrong. If we discard

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this narrow attitude, and adapt a broad vocational view, we will, then, not train a man to be a farmer, but train a farmer to be a man, so to speak. That is to say, we are training a man not simply to know how to plow and to raise cattle, but to know also how to be a better citizen in his community; he will not only plow and raise cattle but, in addition, he will vote intelligently and have power among his fellow men. I say that we may, then, improve the teaching of a subject by changing its outcomes or ideals.

But it is the other field of teaching within which the discussion will lie at this time. I shall pay attention to the improvement of the teaching of agriculture by attention to methods, rather than by the improvement of the ideals determining its subject matter.

Primarily, I believe that methods of teaching, as well as methods of doing anything else, are of fundamental importance today. The waste that we have, the failure to reach high efficiency, is not due to poor ideals so much as it is due to wasteful methods. That is true, I am told, in agriculture. The farmer undoubtedly has good ideals. He wishes to raise large crops and have fine herds of cattle. He wishes to give his family the best possible education and to provide them with the best possible social environment. Where he fails, if he fails at all, is in the waste of his methods, in that his ideals are not being carried out properly. As I see it, the greatest problem of the college of agriculture, if it is similar to the other great social agencies of the world, is to improve methods, since ideals are fairly well established.

The present condition of this important field reveals four points which I wish to mention definitely but rapidly.

The first point is the one to which I have already alluded: namely, that methods of teaching are very important. It is not yet fully realized that administrators, presidents of institutions, deans, boards of curators, and legislators, are not the important elements of an educational situation. The important element in the educational situation is the intercourse between the teacher and the student. The wealth of an institution of learning, its buildings and its equipment are of little value if in the classroom itself improper and ineffective methods of teaching are being used.

Unfortunately, money, buildings, and equipment, are things that we have had in the past to work for with great intensity, but the time has now come when public support is somewhat assured and colleges of agriculture as well as educational institutions in general should begin to turn their attention from providing material equipment to the improvement of methods of teaching within the classroom. When the methods of teaching are unsatisfactory, 75 percent of the efficiency of money, building and equipment might be lost; and even a slight modification in methods of teaching would have results out of all proportion to the effort put forth.

The statement has been made that if we teach principles the student will make his own application; but I venture to say that principles are the easiest things in the world to secure, whereas, the methods of application of those principles to practical situations are the most difficult thing in the world to discover. The Golden Rule was promulgated 1900 years ago, and he who runs may read; any person may understand it; but to find methods by which to apply the Golden Rule to every day situations is still one of the hardest problems we have to solve. Teachers cannot content themselves by saying "We shall give to students the principles of the sub-

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ject, and let them make their own applications," because we would selfishly thus leave to them the most difficult part of their task.

I say that the methods of teaching are the most important of all the factors of the educational situation. Deans and presidents are simply hewers of wood and drawers of water for the teachers engaged in teaching the students in the classroom. That is to say, administrators are simply the men who make the conditions proper, who set the stage so that the work, the contact between the teacher and the pupil, may be the best possible.

The second point is this—that we find great unevenness in the use of efficient methods of teaching. My experience at last summer's graduate school has given me a great deal of faith and interest in what the men in the colleges of agriculture are doing in working out methods of instruction. It was a revelation to me in this respect—that in the college of agriculture the teachers are attacking and solving problems which the elementary school and the high school have been attempting to solve with indifferent success for 50 years. Some teachers of agriculture are solving these problems better than are the elementary and high schools. But while we find some teachers of the colleges of agriculture who are using the best methods, side by side with them we find other teachers who evidently know nothing of these improved methods, and are working things out in less efficient ways.

A third point in connection with the present conditions is this: one reason why the subject of methods of teaching is not given the place it ought to have is that teaching ability is, for the most part, unrecognized in all institutions of collegiate rank. The man who gets the promotion, usually, is the research man, the man who publishes. I say "usually." If there are two men side by side in a department earning an equal amount of money, one of them an excellent teacher and the other a good research man, the man who is most likely to be called to a higher position is the man who has made himself most widely known in his profession—i. e., the man who publishes the results of research.

I believe that the man who invents a new method of teaching in colleges of agriculture, where the primary business of the instructors is teaching, deserves as much credit as the man who invents a new method of mixing rations. The man who is able to find a way to increase the student's results in a given subject by 50 percent deserves as much credit as the man who is able to increase the farmer's crop by 50 percent.

In the fourth place, the reason for the difficulty in judging a man's teaching ability is that we do not have any very definite system or method of judging teaching results. If the teacher is a nice fellow, he is likely to be considered a rather good teacher. If you add to that the fact that his students think he is a good man and good teacher, the matter is settled. There seems to be no definite objective method by which we can say that this man's method of teaching is better than that man's. Here is a man who laboriously works upon a method of teaching and finally evolves one which is adapted to his work, and is effective; but who knows about it? He has no way to advertise his teaching ability. Suppose he had spent an equal time upon some problem in the experiment stations; he would publish such experimental results and everyone would know about them.

A president does not often go into a classroom to observe teaching; the teacher might think that something was wrong with his teaching. Our ineffective professional ethics forbids any person from listening in any

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official way to what is going on in the classroom; and yet the only method by which we are able to get information about methods of teaching is either by having the man advertise what he does himself—and that too is unethical—or by having somebody watch what he is doing. Consequently, because of this professional ethics, many of the methods of teaching which are worked out with excellent results by instructors are not carried over to other people.

It has been a source of pathetic interest to me to listen to men who would tell me, in their enthusiastic way, about some method they had worked out—a method that they do not talk to other people about; a method that to me appeared to be excellent—and yet, because of our professional ethics which prohibits an authorized person from seeing it, the method, described in confidence, will probably go no farther than the auditor.

The foregoing are four of the cardinal points concerning present conditions in teaching—first, that methods of teaching are very important, the most important factor in the educational process; second, that the teaching is uneven; third, that there is little recognition of teaching ability as such; and fourth, that there is no very definite way of judging and of disseminating effective methods.

Because of these conditions there are three methods of making certain improvements in the teaching of agriculture.

The first method in which I am interested is what I call the method of description and dissemination. This method of improving the teaching of agriculture requires some person to visit teachers and classes to discover good methods of teaching as they are being used, and then to disseminate this information among other teachers of agriculture. We may draw a parallel with farming. One method of improving farming is to go from farmer to farmer, and, when a farmer has an effective method of solving some problem, to describe it and disseminate it through bulletins and by other means to other farmers. There are today, within the walls of the agricultural colleges of the United States, enough excellent methods being worked out here and there to keep busy a staff of three or four men for three or four years.

It was surprising to me, in my conferences with the men in the Graduate School of Agriculture at Amherst, to find how many things were being worked out here and there by men who came and talked to me about it casually. Every department, every college of agriculture, has within its own walls a great many such things lying there undiscovered, and needing only a spectator to give them publicity.

The second method is what might be called experimental teaching. The first is the description and dissemination of methods; the second is experimental and differs from the first very much as (drawing a parallel again with agriculture) a description of how farmers perform their labors would differ from an experimental study of the best methods of carrying on this work. Experimental teaching would work out something like this. Certain men would, under controlled conditions, and with expert teaching, try out devices which had been suggested, to find out whether they are effective or not and upon the basis of efficiency would decide whether or not such methods should be disseminated.

I venture to say that within the next 10 or 15 years, when we have become convinced nationally of the importance of methods of teaching,

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Federal or State Governments will establish experiment stations for teaching, as they have established experiment stations for poultry, for hogs, for corn, or for fish. Surely it is as important to educate our children better as to raise better corn, or to improve the living conditions of fishes in the sea.

The third method is one which I have defined as a method of statistical analysis and scientific measurement. In the colleges of agriculture, in the extension division of the agricultural department, and in public education in general, hundreds of thousands of dollars are being spent in various forms of activity. Rules of procedure and methods have been laid down for the direction of this work; but we have no very definite method at present of judging of the effectiveness of the methods that are applied. The strong presumption is that this work can be best measured by statistical analysis and scientific measurement.

One illustration taken from agricultural education, the extension division, may perhaps help to make clear what I mean by "statistical analysis and scientific measurement." In the State of Missouri last year there were organized 331 sewing clubs—a form of long-range teaching carried on under conditions not so good as we have in the colleges of agriculture themselves, but still with a primary purpose which is educational in character. Of these clubs, 91 met only for organization; 117 met once or twice, completed one or two of the lessons, and ceased; and 133 of them lived to maturity. That is, 133 clubs, or 37 percent, had some of their members finish the work that was laid out for them. Out of the total number of members enrolled 30 percent finished their work.

Now, a number of questions would arise if one made a statistical analysis of this situation. Of these questions, I shall specify a very few. Why was there such a large mortality among the clubs? Over 63 per cent died. What methods were used by the leaders of the 133 clubs which survived different from the methods used in connection with the defunct clubs? The successful leaders must have had some particular methods by which they could make their work persist. What methods did the other clubs fail to use? This information is not available anywhere so far as I know, and yet it is information that can be obtained in these particular cases or might be obtained if the thing were being analyzed statistically and scientifically.

Evidently, to answer questions such as these, there needs to be set up a scientific standard of what success means, and then there needs to be a detailed examination of the methods which were used by the leaders of the successful clubs, and an analysis made of the causes of such a large mortality. The superficial statistical examination which was carried on by one of my classes demonstrated nothing except a method of attack. Statistical examination reveals that so far as last year's work was concerned, of those clubs which finished, those that had seven members or less retained a larger percentage of their membership than did the larger clubs. In fact, they were more likely than not to carry through their total membership enrolled. It was found that the larger these clubs, the larger the percentage of membership mortality. In other words, a club of five members was less likely to lose one member than a club of 50 was likely to lose ten members. But, on the other hand, it was found that while the mortality rate in the successful clubs was higher the larger the club, the percentage of large clubs which persisted as organizations was

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higher than for small clubs. That is to say, a club of 50 members was more likely to be successful—that is, to have some of its members carry through to the end—than was a club of seven members; but if one of the clubs with seven members persisted, and one with 50 members persisted, the club of seven members carried through a larger percentage of its enrolled members. Now, it is possible that this would suggest to an investigator the advisability of dividing a club of 30 or 40 members into three or four smaller divisions in order to profit by the lower rate of membership mortality found in small groups.

Again, it was found that in those counties in which a campaign was carried on, the percentage of mortality was greater than in those counties in which a campaign was not carried on. On the other hand, the total number of club members finishing the course in the campaign counties was larger. Here arises the necessity for a definition of success. Is success in a county to be determined by the number of clubs organized, without consideration of their persistence, or by the mortality of the clubs that are organized, or by the total number of members, of individuals, in the county who carry the thing through to the end? That is a question which has to be settled by investigation.

Again, we sometimes find in other club work that some organizers have a higher percentage of mortality among their clubs than do others. One organizer may organize 50 clubs of which 50 percent persist to the end. Another organizer may organize 50 clubs of which 20 percent persist to the end. A basis of determination of the success of organizers is necessary in connection with every institution, and it is difficult to know exactly how to measure an organizer's success; but it may be determined by statistical investigation and by scientific measurement.

I might continue the description of problems indefinitely. The problems that arise in connection with even such a thing as this clubwork are interminable. My object has been simply to indicate here in a general way that in the extension work, in which hundreds of thousands of dollars are being spent, there seems to be a necessity for this kind of analysis and examination on a very large scale over the whole country in order that success may follow effort, and in order that waste may be eliminated.

How is this to be accomplished? It seems to me that it is necessary to have an elaboration or differentiation within the agricultural education departments of the agricultural colleges. That is to say, it seems to me that certain men within that department or elsewhere have to be detailed to this work. These men must give their sole attention to the examination of such questions. They may teach, undoubtedly, they ought to teach, some of the courses in education; but their primary business should be that of collecting facts and data such as these.

It will be claimed by some that work of this sort should be done by the field forces in the extension division and by the teachers of agriculture in the colleges; but I think it is evident to those who study the facts carefully that the teachers and extension forces cannot do it as it ought to be done, in a large way, because in the first place, they are too busy teaching and in the second place, they frequently do not have the statistical and judicial type of mind that is necessary in every case. A good efficiency man such as I have mentioned here would not usually make a rousing propagandist in organizing boys' clubs, and the man who could organize clubs most successfully is frequently bored by statistics; and perhaps in a way he ought to

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be—in part, at least. That is to say, he is of the enthusiastic type, the man who has the social impulse, who likes to get in touch with people and put his ideas across; and for him to sit down and analyze what he does is very much like a mother, after she has had a strong emotional experience of loving her daughter, trying to sit down and psychologize her emotion to determine exactly how it felt. I grant that every teacher ought to do something of this sort, but in order that it may be done comprehensively it must be the particular business of some one man.

If the United States of America were the United States Steel Corporation, the United States of America would have a whole army of men who would be examining into the output, and into the methods of production, to find out where waste might be eliminated and the product improved with less effort. If the United States Steel Corporation were spending for education as much as the United States of America is spending, you may be sure that such an investigation of waste would be going on.

We are belated in the introduction of work of this sort into the field of education; but some men should be detailed immediately for this kind of thing.

The teaching of agriculture, then, in my mind, can be improved by the description and dissemination of methods of teaching, by experimental investigation of effective methods, and by statistical analysis and scientific measurements. It is of such paramount importance that research men should be appointed to give their whole attention to it.

SAMUEL AVERY of Nebraska. I do not think the speaker intended to draw a sharp line, but possibly some of his hearers may have inferred that he was putting one man against another, the teacher and the investigator, as though they were perhaps two different species and had very little in common. Now, I think if any of us will go back over our educational experience we will realize that generally those who were the best teachers in the broad sense, those who built us up the most and whom we remember longest, were also good investigators; and on the other hand those who were rather poor and indifferent teachers were generally those who had no standing in the world of research. I know that is true in many cases and believe that it is generally true. Some, of course, are excellent teachers and have no power of research; others are good research men and have no power of teaching; but I believe that the two more commonly go together than we are apt to assume.

R. J. ALEY of Maine. I have been interested for many years in the matter of improving college teaching. I have much sympathy with the common notion that the poorest teaching in the world may be found in colleges. It is my experience that the great majority of college men resist the sort of proposals made by the speaker. They insist that a mere professor of education cannot speak with authority in any field of instruction. The professor of biology is generally sure that he knows more about teaching biology than does any professor of education. The professor of agronomy is confident that he can teach agronomy without the assistance of any investigator of statistics or experimental teaching. The professor of Latin scorns the idea that suggestions looking toward the improvement of the teaching of Latin may come from the pedagogical laboratory. This is the difficulty that confronts most of our colleges in the matter of improv-

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ing teachers—that you meet there with a resistance that you cannot overcome. If as a college executive you seek to improve the teaching in any department, you have got a full-sized row on your hands. The union rules are carefully and loyally obeyed. If the teaching in English is distressingly bad, and the professor of Latin privately knows it is bad, and you undertake to improve it, you are against a solid, reinforced concrete wall of Latin and English and biology and physics and everything else. How can we break down that wall?

C. A. Lory of Colorado. We have succeeded in breaking through that wall. For some years past we have been convinced that college teaching was not up to standard. The teachers on their part vigorously contended that they were not recognized as were the station men and the extension people, and that no one was interested in their teaching. We acknowledged the force of their argument but stated that they themselves were to blame; that if they would push the work of instruction as earnestly as the station men were pushing the work of investigation and as enthusiastically as the extension workers were pushing the work in their field, we would pay more attention to the teachers. We also stated that we were quite as ready to recommend salary increases for good teachers as for good research men and good extension workers, but only for teachers who were good teachers.

So we earnestly set ourselves on a definite plan to try and solve the problem of improving our teaching, and we have been at it now for two years. Last year it was agreed that we would make a study of the teaching in all departments. We formulated a plan in each department and tried it for a month and reported. These reports proved very helpful. We found that we had some excellent teachers and that some teachers were using methods that others could use to advantage. We also found that there really was a field for improving the teaching, and we succeeded in damaging this concrete wall a little by getting a somewhat different point of view.

This study is now going forward with this addition. Last year a committee was appointed to investigate the teaching methods. It naturally got into trouble, because in making a study of teaching methods the personal element inevitably enters; and for a time I did not know whether it would be necessary for the president to play the part of diplomat or referee; but diplomacy won. This year's committee, instead of pursuing the survey method, searches for the best methods of teaching, and reports upon them monthly in a general faculty meeting. In brief, some scheme for the improvement of teaching is presented monthly. The wall is crumbling piecemeal and bids fair ultimately to be overthrown.

I am frankly committed to the proposition that teaching shall be placed upon the same or a better basis than research or extension; if anything, to over-reward the exceptional teacher for the time being in order to assist in bringing the teaching service up to the standard now set by the other lines of work.

K. L. Butterfield. How would you outline any test of teaching efficiency?

C. A. Lory. We worked on this matter for a couple of years, and finally took it up with some of the men who supervise city teaching. We then outlined a project in our faculty council dealing with the study of

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our methods of teaching. We called upon our departmental heads to outline their work a week ahead, to make reports, etc. We used a score-card. Then each department carried through this outline for a month, studied its own work on the basis of this outline and made a free and frank and full report.

In some departments the workers were half-hearted; in others, they were very enthusiastic. We are now getting a very good reaction. Our men appreciate learning each month about something that somebody is doing somewhere. We find the published reports of the Society for the Promotion of Engineering Education very helpful.

THE CHAIRMAN. We have escaped the condemnation which was suggested by Dean Charters' paper. We have given three-fourths of our time to the teaching problem, and must devote the remaining fourth to the problem that appeals so much to us as administrators—the problem of organization and administration.

May I for the sake of emphasis call attention to one point in this connection? It is the matter of publicity. I think it is very important, right within the faculty itself, to have good methods brought to light. Then, for another thing, it would give faculties something to do at faculty meetings which is worth while. Faculties, I have observed, like to spend their time in legislating about administrative details instead of leaving them to the administrative officers concerning whom they complain; and if they could really get interested in the problems of teaching and have some publicity within the faculty of the school or college itself, it would be extremely helpful, regardless of whether a score-card or some other method were used in checking up the results.

We have a problem facing all of our educational institutions with reference to the length of the academic year, its division into terms, and the like. A paper dealing with this subject will be presented by President H. J. Waters of Kansas.

THE ADVANTAGES AND DISADVANTAGES OF THE DIVISION OF THE COLLEGE YEAR INTO FOUR TERMS OF TWELVE WEEKS EACH

BY H. J. WATERS

The American school system is organized on the plan of approximately 36 weeks of work and 16 weeks of vacation. In some cases teachers devote a part of their vacation to research work in order to advance the world's knowledge, to study the better to fit themselves for the discharge of their duties as teachers, or to teaching in a summer school for additional compensation; but for the most part college teachers have a comparatively unprofitable vacation of nearly a third of a year.

It is not, however, a matter of such vital public concern as to what the teachers do during this vacation period, for with few exceptions they are employed for only nine months in the year; but it is a matter of vital concern to society as to how efficiently the half billion dollar college plant is being used and as to how the third of a million college students employ their time during the interim of nearly four months between college years. Society has even a deeper concern in this matter and that is as to what effect the example of the colleges and universities of the country with respect to the division of the year into work period and vacation period

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has upon the high schools and the graded schools in the division of their respective school years into work period and play period. Our public school system is interlocking from kindergarten to university. It is too much, therefore, to hope that the high schools and graded schools will take upon themselves burdens which the colleges have not first imposed upon themselves.

If, therefore, it should be found that the work-year of the college may be extended to 45 weeks with profit to the students and with advantage to the teachers, and with a substantial increase in the degree of efficiency with which the school plant is utilized, it will be but a short time until we shall have the working period in the lower schools correspondingly increased.

THE LONG VACATION A WASTE

The present plan of dividing the year into school period and vacation period has long been out of date. It has come down from a time when 36 weeks was as much time as the student could be conveniently spared from the duties of the home, the farm, or the local workshop. Now, with our industries centralized, with the duties of the home reduced to the minimum, and with opportunities for employment in vacation brought to the lowest point in history, there no longer exists the economic need there once was for closing the educational institutions for a long period of time. I venture the opinion that a majority of the young men and young women in American colleges today have no opportunity to use the time while the college is closed with profit to themselves or to their families.

The question which presses itself upon us as college administrators is, whether or not these young people may not remain in college during a larger part of the year than they now do with greater profit to themselves and at a relatively slight increase in the cost of maintaining these institutions.

Can the teacher of undergraduate students carry his present load of from 14 to 16 credit hours a week for 45 weeks instead of 36 weeks a year, without lowering the standards of college teaching, and without injury to the teacher's health?

Can the undergraduate student carry an assignment of from 15 to 18 credit hours a week through the present college year and through another session of nine weeks without lowering his standards of scholarship and without undermining his health?

Is the weather during the summer months such as to enable the teacher and the student to carry a normal load and to do standard work without injury to health or without the lowering of vitality to such an extent as to interfere with work the following year?

The only way in which these questions can be answered with any degree of definiteness is by actual trial, and we have been trying them ever since Dr. Harper began teaching Hebrew in the summer because there was not time enough in which to teach it in the winter. The results of the trials thus far made indicate that both the teacher and the student can on the average put forth a well sustained effort over a substantially longer period of time than is covered by our present school year. So far there have been no general complaints of teachers or students being overworked, except such complaints as they themselves make, and there have not been among either teachers or students a sufficient number of cases of nervous break-

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down due to overwork, to attract public attention. College and university teachers are considered to be among the very best risks which life insurance companies take.

When the University of Chicago began the experiment of teaching four quarters a year instead of three, the institution was careful to safeguard its standards by permitting each teacher to teach only three quarters a year. Whatever may have been President Harper's personal opinion regarding the need of the teacher to rest nearly a third of the year to be in fit condition to teach the other two-thirds, he realized that both educational tradition and public opinion approved the long period of idleness and that it was advisable under the circumstances to respect both.

So far as I know no restrictions were placed upon the student with respect to the number of terms a year he might attend school and I believe that from the outset he was left free to pursue his studies four quarters a year, and year after year if he so chose.

Soon it came about that the teachers were permitted to teach four quarters consecutively for a limited time and thereby accumulate a leave of absence for a half year, or for a year as the case might be. The theory was that this earned half year or year would be used in part for rest and in part for the purpose of studying to gain what had been lost during the years of heavy teaching. But it actually happened that in most cases these men did not feel the need of more rest than the six or seven weeks of vacation and the holidays each college year afforded and they felt that they had been able to keep up in their respective subjects by studying while they taught. During this earned leave of absence, therefore, they accepted offers to teach in other institutions, to deliver public lectures, to write books, or to engage in other occupations that were quite as strenuous as teaching.

At first to safeguard standards, most institutions had a provision prohibiting the employment of teachers in more than one summer school without a prolonged vacation or without an opportunity to get fresh inspiration by study elsewhere. But sooner or later this provision fell into disuse under the pressure of the rapid development of summer work and of the desire to have the best teachers of the institutions teach during the summer session. A few of the institutions of the country have attempted to safeguard their standards and to promote a spirit of research among their teachers by having no summer session, but their gains in these directions have been small because their best teachers have generally accepted employment in the summer schools of other institutions.

THE COLLEGE YEAR HAS BEEN LENGTHENED THROUGH THE SUMMER SCHOOL.

The result of the wide-spread experience with the summer school in the United States during the last two decades does not indicate that there is any injurious effect upon the teacher or upon the student arising from doing work at that season of the year or from extending substantially the length of the college year. The results thus far attained also fail to indicate that the standards of work are lower in the summer school than in the regular season.

After 25 years the University of Chicago stands practically alone in maintaining a college year of 45 weeks divided into four terms, or quarters. But there are many universities and colleges in the country in which courses

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are open to college students during as many months of the year as at Chicago. As yet, however, the college year in such institutions is of the traditional length, 36 weeks; and the extra teaching is done in a so-called summer school.

In the beginning, college summer schools were designed primarily for teachers in the secondary schools and the courses offered were for the most part reviews of high school subjects. Now the patronage of the summer session is quite evenly divided between high school teachers and the students of the regular sessions, and nearly all are doing work for credit toward graduation. Courses which do not carry college credit are largely neglected. Thus the summer school has become in fact a definite part of the college work quite as much as has any other session of the college, but in the college organization it is, with the exception of the University of Chicago, a thing apart from the regular year's work. We have not been able to get far enough away from the old notion that the summer school is a distinct entity to think of it as a part of the regular college year. We need to drop the term "summer school" from our college nomenclature and to consider the summer work as one session of the regular college year.

The proposal we frequently hear made to lengthen the college year, therefore, is only apparent and not real, for the college year in most institutions has already been lengthened. The principal thing yet remaining to be done is to bring all the teaching into a unified college year and to divide the year into such terms or periods as will be best adapted to the local conditions of climate, and the convenience of the students and teachers.

THE SUMMER AS A SEASON FOR TEACHING AND STUDY

Whether or not the summer is a suitable time in which to teach and to study, we are teaching and studying more and more at this season and we are doing both without any deleterious results. The summer semester in the German university is quite as important as the winter semester.

An interesting light has recently been thrown on the influence of the season of the year upon the mental activity of college students by the results of a very painstaking inquiry made by Dr. Ellsworth Huntington, of Yale University.* The tests made were with students at the West Point Military Academy, and at the Annapolis Naval Academy, where students lead extremely regular lives with the minimum of outside distractions and where recitations are graded with great severity and regularity. The marks are handed to the heads of departments at frequent intervals and are posted where the students can see them. No class is taught in divisions of more than 10 or 12, so that every student has a full opportunity to show each day how well he is prepared. To avoid the possibility of favoritism the instructors do not keep the same division throughout the term, but change every few weeks.

The results summarized (Figure I) are those in mathematics for the entering classes at Annapolis for six academic years from 1907-08 to 1912-13, and those of the first year in English at Annapolis for the year 1912-13. The records in mathematics at West Point are for a year and a half. The entire number of students whose records have been studied is between 1,700 and 1,800, or the equivalent of 1,900 students for a full college year.

*Ellsworth Huntington, "Civilization and Climate," Yale Press, 1915, pp. 77-82.

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Weekly average grades are compared at different seasons of the school year.

The three curves of mental activity (Figure I) agree in their general trend and show two principal maxima, one in the fall and one in the spring, with an extended minimum in midwinter. No mental records were kept in the midsummer months, but the form of the curves indicates that had such

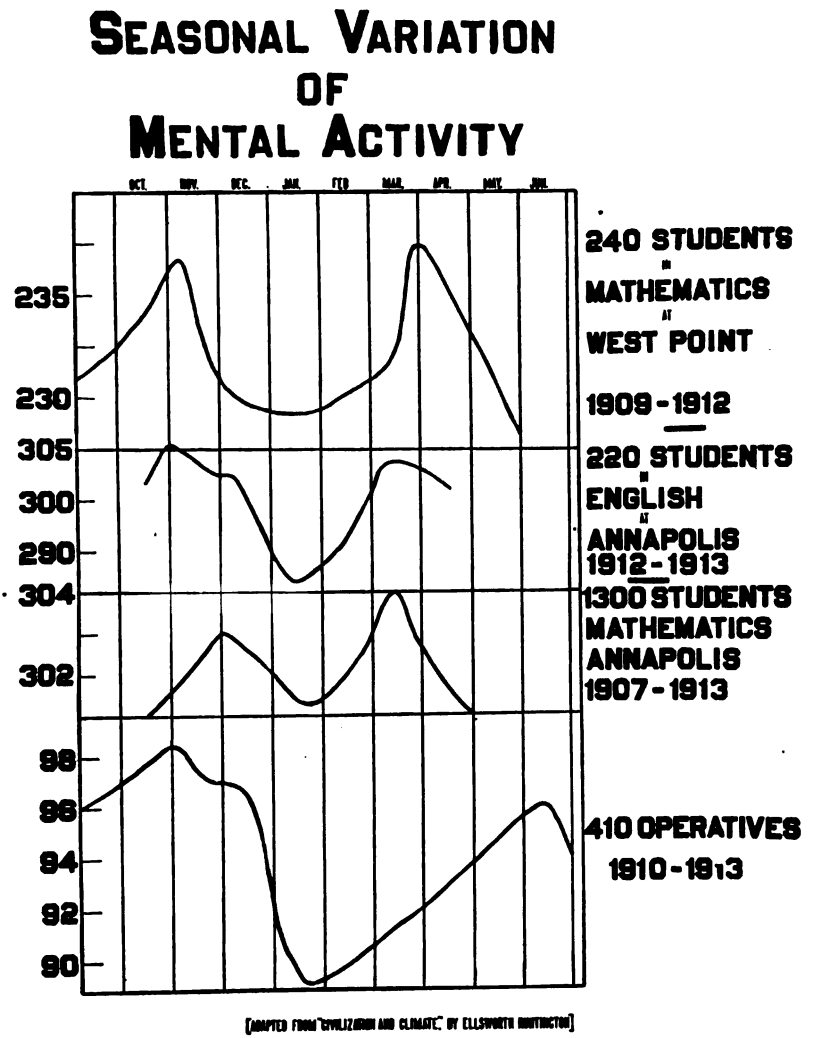

FIGURE I

tests been made another minimum would have been shown for that season. The seasons of highest mental efficiency, according to these studies, are during November and during March and April for the climates of West Point and Annapolis. At these seasons the mean temperature at West Point and Annapolis is about 40° F. The maximum efficiency is reached

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earlier in the fall and later in the spring at West Point than at Annapolis, the difference in this respect corresponding approximately to the difference in mean temperature of the two places.

The relatively long period of low mental efficiency shown to exist in midwinter is a surprise. It has been generally supposed that the season of lowest mental efficiency in the academic year is in the early fall or in the late spring. These results show it to occur in midwinter—in the very heart of the school year. Under a system of rigid examinations at the end of each semester we are holding these examinations at the two seasons when the students are least capable of giving a good account of themselves.

MENTAL AND PHYSICAL ACTIVITY RESPOND ALIKE TO SEASONAL INFLUENCES

No mental tests were made during the season corresponding to that of the summer school and there is, therefore, no direct means of determining how low the curve would fall in June, July, and the first half of August. Dr. Huntington* has made a very exhaustive study of the physical activity of factory operatives at all seasons of the year. The curve at the bottom of Figure I shows the physical activity of 410 factory operatives in Connecticut for the seasons covered by the college year. As the climate of West Point and Connecticut are fairly comparable, if the mental curve for West Point be compared with the physical curve for Connecticut, it will be seen that they agree in general. The factory operatives in Connecticut reached their maximum efficiency a few days earlier in the fall and more than two months later in the spring than did the students at West Point. The same marked depression in activity shown in midwinter for students is also shown for factory operatives.

As an indication of the effect of the summer season upon mental activity, the results of the studies made by Dr. Huntington on the physical activity of factory operatives are shown in Figure II.

The operatives studied were piece workers and were paid according to the amount of work done and not at a fixed rate per day. No restrictions as regards the amount of output was imposed by the employers or by labor organizations. The operatives were doing essentially the same kind of work each day and the studies for the most part extended through the year with the same persons.

A study of Figure II shows that, in a climate such as Connecticut affords, there are two periods of low efficiency, one extending through January, February and March, and another in July and August. The depression in midsummer was slight, however, compared with that of midwinter. Essentially the same results were obtained at Columbia, South Carolina, except that the summer depression was slightly lower and extended over a greater period than did that of the midwinter.

At Jacksonville, Florida, the curve still shows two minima, but the relation of the two is reversed from that of the curve of operatives in Connecticut and a long major low depression occurs in summer and a short minor low in February. At Tampa, Florida, there is but one high during the year and it occurs during the cool months of winter and there is one low which occurs during the summer months.

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*Ibid, p. 114 ff; 289 f.

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The general health of the community is best in spring and early summer, and in the fall, and is poorest in midwinter and in midsummer. Midwinter is the season when contagious diseases such as measles, whooping cough, diphtheria, scarlet fever and mumps are most prevalent and the only

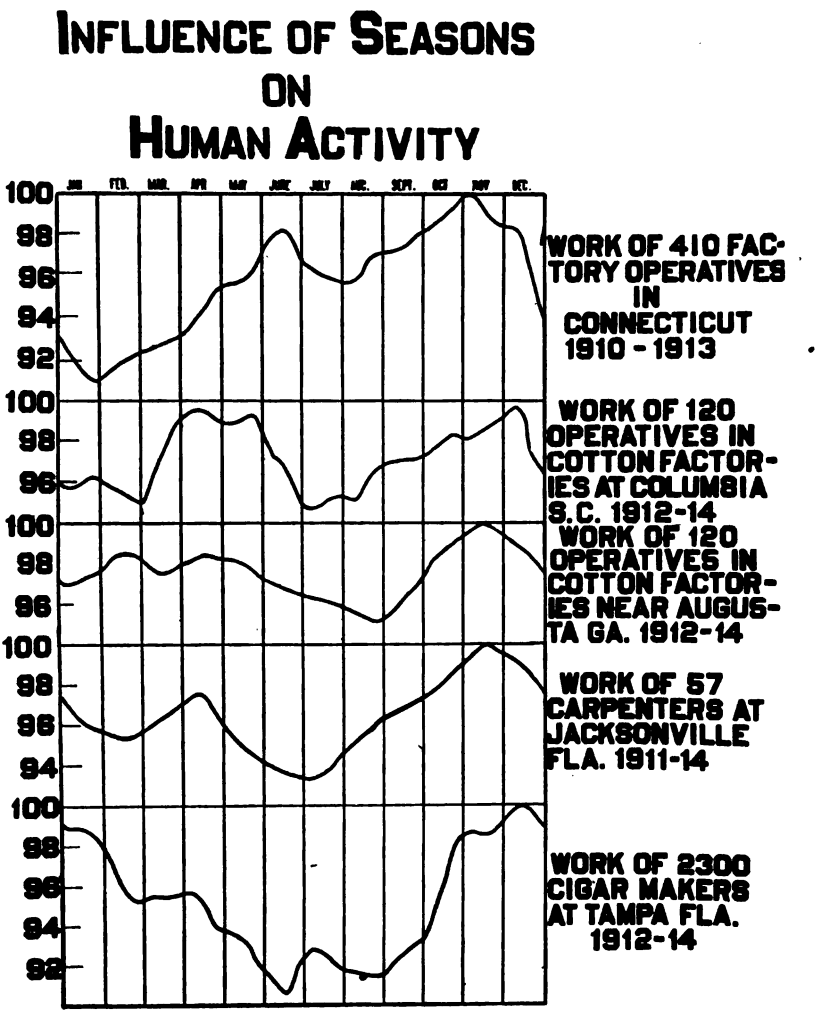
INFLUENCE OF SEASONS
ON
HUMAN ACTIVITY
100
98
96
94
92
WORK OF 410 FACTORY OPERATIVES IN CONNECTICUT 1910 - 1913
WORK OF 120 OPERATIVES IN COTTON FACTORIES AT COLUMBIA S.C. 1912-14
WORK OF 120 OPERATIVES IN COTTON FACTORIES NEAR AUGUSTA GA. 1912-14
WORK OF 57 CARPENTERS AT JACKSONVILLE FLA. 1911-14
WORK OF 2300 CIGAR MAKERS AT TAMPA FLA. 1912-14

FIGURE II

season when they are usually epidemic. Midwinter and midsummer are the seasons when gastric disturbances due to overeating and poor elimination most frequently occur.

At the Kansas State Agricultural College a careful record is kept of the health of students. Each student pays a compulsory fee which provides a fund for the employment of two college physicians. An accurate record

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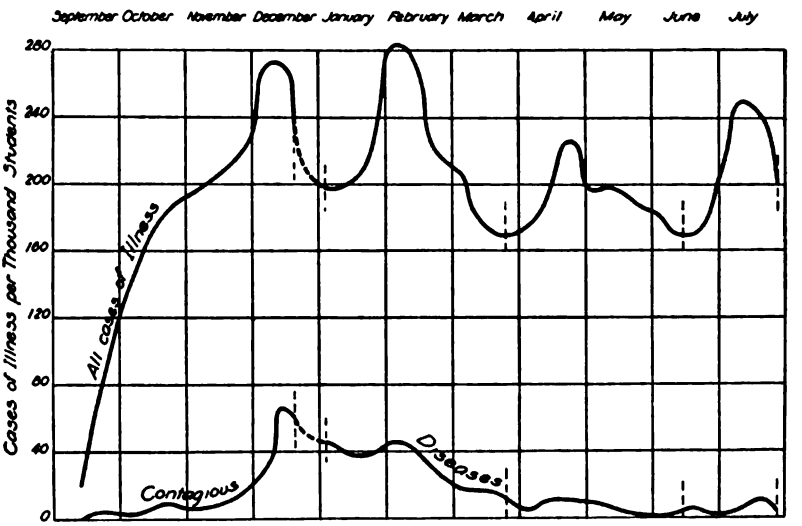
is kept of the number of office and bedside calls made by each physician each day and the nature of the illness. In Figure III the physicians' records by months for the year 1915-16 are given. The upper curve shows the total number of cases for which treatment was required. The lower curve shows the number of cases of contagious diseases such as measles, diphtheria, scarlet fever and la grippe which occurred. In constructing these curves correction has been made for differences in the number of students in attendance at different seasons of the year so that the curves show the number of cases for each thousand students enrolled. The curves scarcely require comment. The difference between autumn and spring on the one hand, and midwinter and midsummer on the other, is very striking in respect to the total number of cases of illness and much more striking in respect to the number of cases of contagious disease.



THE INFLUENCE OF SEASON UPON THE HEALTH OF COLLEGE STUDENTS
KANSAS STATE AGRICULTURAL COLLEGE 1915-1916

FIGURE III

Every thinking person will admit that in nearly all the climates of the United States, the spring, summer and autumn months are the best parts of the year for the work of children in the grades and that winter is the worst season. In winter the attendance and character of the work of the children are affected by many such causes as colds, contagious diseases, inclement weather and bad roads. If children need an extended vacation, the winter term is the time when it could be given with the least interruption of their school work. Of course the winter season, when the children cannot play in the street or the park, is an exceedingly inconvenient time to place the complete responsibility upon the mothers. It is better perhaps to let them attend school a part of each day even though their mental progress be slow.

Obviously we have been expecting too much of our students in midwinter and have been inclined to overemphasize the depressing influence of summer heat upon the activity of mind and body.

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METHODS OF OVERCOMING THE DISADVANTAGES OF SUMMER HEAT

University work in summer is acknowledged by all who are familiar with the facts to be entirely feasible from the latitude of Chicago northward. South of this parallel there are difficulties to be overcome, but these difficulties are not insurmountable. The recitation and laboratory periods are spent in reasonable comfort in the large, well-aired brick or stone buildings. Almost anywhere in the Central and Southern States, the study hour in midsummer in an upstairs room in a frame lodging house beside an artificial light is well-nigh unbearable.

It is entirely feasible, however, to provide artificially cooled study halls of sufficient number and capacity to accommodate all the students who will attend the institutions during the summer quarter. The library and a few improvised study rooms would fully meet such requirements. In those institutions which have ample dormitory facilities it would be feasible to undertake to cool the sleeping rooms by artificial means during the short periods of excessive heat. The cost of artificially cooling the study halls in the evening and even of cooling the sleeping rooms at night in summer would be slight compared with that of heating the entire college plant during the winter months. With these points of objection removed, work in the summer quarter would become a pleasure and a profit.

THE WORLD DEMANDS YOUNGER GRADUATES

By lengthening the college year a fourth, it would be possible to enrich the curriculum and to send graduates to their life work educated more broadly and more thoroughly than we now educate them and that without detaining them in college longer than we now do.

By extending the school year in the grades and the high school as well as in the college, we should be able to educate our children better than we are now educating them and yet set them at their life work substantially earlier than we now do. The testimony of the largest users of the college output is that the product reaches them too late for the best results. These users of the college product would regard it as a distinct advantage to secure the graduates at least a year earlier than they now receive them.

THE SCHOOL SHOULD KEEP THE PUPIL BUSY THE YEAR THROUGH

In the lengthening of the college year, however, the principal advantage is not to be found in the increased degree of efficiency with which the school plant may be utilized. It is not to be found in the saving of time of the pupils, and enabling them to begin their life's work a year earlier than now with a better education; but the advantage clearly lies in the fact that the school system has provided a means of keeping the young people profitably employed throughout the most of the year up to a point where they enter the industries and professions.

K. L. Butterfield. This year we have gone on to a new plan of dividing the year. I am not sure whether it is a four-term plan or a three-term plan, that is to say, we have not yet committed ourselves to a summer term containing the regular schedule that obtains for the rest of the year, but we have divided the period of 36 weeks into three terms.

Our present thought about the use of the summer is that we can develop by this system, better than under the old one, a considerable amount of

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summer field work for students. We then hope that we can develop seasonal work in the field for agricultural schools running sometimes from about April 1 to about October 1, in part for freshmen from the cities but more particularly for men who are specializing in some form of agriculture or horticulture. It is likely that before long we will be graduating some men in April, so that they can get out into work when the season begins.

The thought among our faculty at present is rather against developing a summer term of the same sort as the other three terms, though we have not worked out our ideas on any such scientific basis as has been presented by President Waters.

When I was a student at the Michigan Agricultural College, regular college work continued all summer. The long vacation occurred during the winter. This system does not now obtain. There were two things to be noted about it. One was that many students worked during the winter teaching school for 12 to 16 weeks in a 14 weeks' vacation; some leaving a week early and returning a week late. That meant a pretty strenuous year, but they stood it. It must be remembered, however, that both work and environment were changed. Then too, in those days we worked two and a half hours every afternoon in the open during the summer, and also drilled three hours a week. My impression ever since, during a period of 25 years, has been unfavorable towards a solid summer of work of college grade, for the student who is in school the other three terms.

I attended a six-weeks' summer school for three different summers at the University of Michigan, some years after my undergraduate work. The general impression among both teachers and students was that the machinery was running at about 60 to 75 percent of maximum efficiency during the summer; a concession, in other words, to the idea that you can not expect to do the same quality of work during the summer that you can do at other seasons.

A practical factor, not a decisive yet a serious factor, stands with us in the way of the general adoption of a four-term plan. Over half of our men have to earn their way, and the chance for earning money during the summer in New England is good. However, without committing ourselves definitely to a 48-weeks' year, we have made a sufficient start so that if it seems wise to go on in this direction we can do so.

R. J. Aley. I was born and reared in an Indiana community that had neither a high school nor an academy. In 1872 there was founded in the northern section a normal school that was open 50 weeks in the year. By teaching a rural school for five or six months and attending this normal school for the remainder of the year I secured my secondary education and two years of college work. This 50-week year, begun as a boy, has been kept up to the present time.

My experience is counter to that of President Butterfield in one respect. For a number of years I taught in the summer session at Indiana University. It was the current opinion on that campus of both teachers and students that in the summer we were speeded up to about 130 percent instead of being slowed down to 60 or 70 percent. I secured with all my classes far better results than I got in the regular terms.

Schools of all kinds ought to be open throughout the year. Perhaps my own habit has warped my judgment; but I have never been able to understand why the business of study or directing the study of others is more strenuous than the work of directing a steel mill, a banking corpora-

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tion, a department store, or a farm. It is simply the custom to work only three-fourths of the year in intellectual pursuits. This custom has great momentum, so that the attempt to make a change will meet with great resistance. Those who for years have enjoyed a three months' vacation are not likely to give it up easily. Possibly if I were accustomed to a long vacation I would not be talking as I now am. In common with many other college executives, I am unable to find more than a week's vacation during the year.

I like the term much better than the semester. I think, however, I am the only representative of my faculty that has any use for it. We waste time and lose motion in the Christmas vacation, which occurs only a month before the mid-year examinations. There would certainly be great gain if our terms ended just preceding a vacation.

I would be pleased to see this Association stress two ideas, namely: a longer college year, and four terms of 12 weeks each.

A. R. Mann of New York. We held the first long summer term in the New York State College of Agriculture at Cornell in 1914, a term coordinate with the regular semesters. We now divide the 12 months of the calendar year into three terms of academic work. Students and faculty alike have approved the plan and with increasing experience like it better. We had 41 students the first summer and 262 this past summer. The students like the arrangement because they receive more individual attention. Perhaps the summer term would lose some of its value if the classes were to become as large as they are at other times of the year. The students like it also because there is adequate opportunity for the field work. We established this third term primarily for the benefit of the plant departments, and thus far the work given has been largely that of the plant departments, the animal departments not yet making much contribution. We make our third term coordinate with the other two terms, and, therefore, the student can lessen the length of time required for his degree by attending the summer term. The faculty like this arrangement because they are on the nine-months' basis. Prior to the establishment of this system they were expected to serve 12 months. We did not regard 12 months' term of service desirable, and since we have gone on the nine-months' basis we are more than ever convinced that it is to be preferred. With the three terms, we can rotate the time of employment of the staff members so that they can go elsewhere to take work during the time other institutions are in session. At this particular time we have men at Johns Hopkins, Columbia, and elsewhere, who will teach during the summer term. We have found such an arrangement a decided advantage.

T. D. Boyd of Louisiana. Some years ago, when the question of holding summer schools was first broached in Louisiana, the older educators declared that the plan would be a failure; that it was useless to undertake it on account of the heat. It was undertaken, however, and the situation there today is this: The Tulane University has a regular six-weeks' summer session with over 1,000 students. The State University, which enrolls about 850 students during its regular session, has a nine-weeks' summer session attended by about 600 students. It is very seldom that any member of the faculty declines to serve during the summer session, notwithstanding the fact that he works during the summer at a lower rate of compensation than he receives during the regular academic year. This ex-

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perience in a section where the summers are long, and supposed to be depressing and enervating, shows conclusively that any college can if it will continue its sessions for a longer term than 36 weeks. We are in session at the Louisiana State University for 45 weeks every year.

EUGENE DAVENPORT of Illinois. I have been asked to present the following resolution:

"Resolved, That there be created by the college section of this Association a division of home economics, to consist of the heads of departments of home economics, or their accredited representatives."

The adoption of this resolution will provide a division of this section in which the people who are responsible for the departments of instruction in home economics in the land-grant institutions may confer, and an avenue whereby they may reach this section, and, therefore, the general Association. I understand that this proposed division would be established on the same basis as the division of engineering of the college section, and that it will work with and report to this section.

E. C. PERISHO of South Dakota. I am heartily in favor of the resolution for the reason that we cannot adequately develop the agriculture of a state without developing its homes. The two must go together.

A. F. WOODS. The home economics organization in our institution has reached the point where, administratively, it must consider its own problems very largely, although closely in connection with the other general problems of the college The problems of home development are so large, so important and so different in many ways from the agricultural problems that it is absolutely essential that we should recognize them in some such way as this.

S. AVERY. Home economics is a subject that is not logically a part of agriculture, or of engineering, or of any of our grand divisions. It is a subject that will ultimately logically stand by itself as an important part in our land-grant college work, indeed in all collegiate work. It is fitting that we give at this time formal expression of our approval as to the great and growing character of this work by granting this request.

On motion, the resolution was adopted.

THE CHAIRMAN. The Chair seeks information touching the status of the engineering division. It was created at the 1915 Convention (Twenty-ninth Proceedings, pp. 156, 168, 194) so far as the action of this section is concerned, and "the details of the merger * * * with the college section * * * were referred (by the Land-Grant College Engineering Association) to (its) executive committee with power" (Twenty-ninth Proceedings, p. 297). The Chair is not informed what definite action, if any, has been taken by this committee, but in view of the fact that the engineering men are registering as delegates to this Convention of this Association, and that their representatives are listed upon and taking a prominent part in the program of this Convention, it seems fair to assume that the invitation extended last year has been accepted.

However, the Land-Grant College Engineering Association still seems to exist. The program of this Convention provides for a discussion as to the "relation which should exist between the Land-Grant College Engineer-

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ing Association and the Association of American Agricultural Colleges and Experiment Stations." As the Chair understands it, so far as the Association of American Agricultural Colleges and Experiment Stations is concerned, the Land-Grant College Engineering Association does not exist; it has become simply a division of this section, assuming that actions—that is to say, registration and participation—speaks louder than words.

Now, the officers of this section have not been consulted as to the program of the division. No replies have been received to letters sent by sectional officers in reference to the divisional program to the secretary of the division. The divisional officers have dealt directly with the Executive Committee, which has printed the divisional program as submitted without referring it to the sectional officers. A joint session of the section and the division has been arranged by the divisional officers. Where are we at? Will the chairman of the Executive Committee enlighten us?

W. O. Thompson. It has been my custom, as Chairman of the Executive Committee, to write at an early date to the program committee of each section with a view of securing sectional programs. I found on correspondence with the engineering people that as a matter of fact the Land-Grant College Engineering Association did not seem to have disbanded as a separate organization; that the name still held; that, as the Chair has remarked, the question as to whether or not the organization should continue to exist as such was scheduled for discussion upon this year's program. Now, if the engineering people of their own volition, in response to the invitation of this section, entered the Association of American Agricultural Colleges and Experiment Stations, I cannot see that the question of the continuance of their former organization is at all pertinent. The question of a withdrawal from this organization might be discussed, but that of continuance in this organization seems to me entirely inappropriate. Yet, notwithstanding, the question has actually been listed on this year's program. I am forced to conclude, therefore, that these people do not understand exactly what they did at Berkeley. Possibly by the end of this Convention they may see more clearly what their status is and put an end to an anomalous situation.

In view of the fact that there seems to be some question as to the exact situation and in order that the matter may be correctly understood, may I say that there are three sections to this Association—the College Section, the Station Section and the Extension Section; that these have been definitely and specifically designated by the terms of the Constitution as "Sections." Now, the Constitution permits any section to make as many divisions as it pleases, and, acting in accordance with this constitutional provision, the college section at the 1915 Convention constituted the engineering division and, a few minutes ago, it has constituted the home economics division. The college section, therefore, now consists of the section as such, the engineering division and the home economics division. When, therefore, the meeting is held on Friday afternoon next, in conjunction with the engineering division, the meeting will really be that of the college section, considering questions dealing with engineering instruction.

The report of the nominating committee was made by its chairman and, on motion, was received and adopted (see page 167).

On motion, a recess was taken until 2 p. m., Friday, November 17, to meet in session with the engineering division.

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ENGINEERING DIVISION OF THE SECTION ON COLLEGE WORK AND ADMINISTRATION

Afternoon Session, Wednesday, November 15, 1916

The division was called to order at 2 P. M., by the chairman, G. W. Bissell of Michigan.

The Chairman. The report of the secretary sets forth in brief the history of the campaign in which we are now engaged in connection with the engineering experiment station bill. Dean A. A. Potter of Kansas will present this report.

Report of the Secretary

A. A. Potter

At the fourth annual convention of the Land-Grant College Engineering Association, Dean O. L. Waller of Washington presented a draft of a proposed bill for mechanic arts experiment stations, its phraseology being based upon that of the Hatch Act. On motion, the executive committee of the association was authorized to take such steps as seemed advisable in the furtherance of the campaign to secure federal aid in the interests of engineering experiment stations.

Authorized by the executive committee, the secretary has made a study of proposed measures in the interests of such experiment stations and, on October 26, 1915, issued a brief setting forth their objects. This brief was sent to the officers and boards of all national engineering societies and many state and local societies, to engineering periodicals, government engineering bureaus and to many prominent engineers. It elicited many valuable suggestions. The national engineering societies as a whole were found to be opposed to the proposed bill and to favor the establishment of several large experiment stations.

While endeavoring to overcome opposition and to work up sentiment in favor of the bill, the secretary made an investigation, through consulates and friends in foreign countries, of the aid given by foreign governments to engineering research. The results of this investigation were published as Senate Documents Nos. 353 and 446, of the 64th Congress, 1st session and, also, in the April, 1916, bulletin of the Society for the Promotion of Engineering Education.

The bill was prepared in several forms and submitted for criticism to the executive committee, to former officers of the Land-Grant College Engineering Association and to others interested in encouraging the establishment of such research stations. In one of the later forms which the proposed measure took, the supervision of the stations was vested in a committee which included representatives from the Department of the Interior, the Department of Commerce, the Department of Agriculture, the War Department and the Navy Department. This proposition provoked considerable criticism.

The chairman and secretary of this division met in Chicago on January 28, 1916, and, after a careful consideration of all objections and suggestions, drafted the bill in its present form, employing the term "engineering" throughout as implying a branch of the mechanic arts. The bill was again

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widely circulated and an effort was made to interest the land-grant institutions in working up a sentiment in its favor. Each institution was urged to appoint a committee whose duty it would be to canvass the industries, the influential political leaders, engineering societies and commercial organizations. Senator Newlands of Nevada introduced this bill March 10, 1916, and it was referred to the Senate Committee on Agriculture and Forestry.

During this campaign the secretary sent nine circular letters and briefs to the executives of the several land-grant institutions, and carried on a lively correspondence with the executive committees of the National Engineering Societies, of the Association of American Agricultural Colleges and Experiment Stations, and the Land-Grant College Engineering Association, and with influential people, with a view of combatting opposition, converting hostile interests and securing support. Every opportunity was seized by the executive committee of the last named organization to interest state and local engineering societies. Many prominent alumni of the Massachusetts Institute of Technology, and of Cornell University, several state and local engineering societies and commercial organizations gave to the measure their active support.

A public hearing was held before the Senate Committee on June 24. This hearing is reported as a Senate Document of the 64th Congress, 1st session. The land-grant institutions of Ohio, New Jersey, Texas, Nebraska, Illinois and Kansas were represented; but it must be said that most of the land-grant institutions took little interest in the measure.

Dr. W. R. Whitney, director of the Research Laboratories of the General Electric Company, has valiantly served us, has combatted strong opposition and endeavored to create favorable sentiment. Senate Document No. 446 of the 64th Congress, 1st session, evidences his effective work in behalf of the Newlands bill.

Our experience in this campaign leads us to believe that engineering experiment stations at land-grant institutions can be made a reality if the college administrations will actively campaign in the interests of such legislation. If the bill is to pass Congress, we must have the cooperation of all those interested.

In October, 1915, the secretary canvassed the opinion of the executive committee and of many members of the Land-Grant College Engineering Association regarding the advisability of maintaining its identity as a separate organization. The majority were strongly in favor of its continuance as a separate association, which should be affiliated with the College Section of the Association of American Agricultural Colleges and Experiment Stations. This question is listed on the program of this division.

THE CHAIRMAN. The Chair appoints as nominating committee Dr. H. W. Tyler of Massachusetts, and Deans A. Marston of Iowa and A. W. Richter of Montana.

"The Appropriate Field in Engineering Extension for the Separate Land-Grant-College and the State University" will be discussed by Dean D. W. Spence of Texas.

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The Appropriate Field in Engineering Extension for the Separate Land-Grant College and the State University

By D. W. Spence

It is specified in the Morrill Act that the leading object of the Land-Grant Colleges shall be, "without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The second Morrill Act referred to the colleges established under the first Morrill Act as colleges established "for the benefit of agriculture and the mechanic arts." So far as I have been able to ascertain, there is nowhere any inhibition against the Land-Grant Colleges offering work in any and all lines of engineering. Certainly the catalogs of the various institutions indicate that in their intra-mural instruction nearly every field in engineering is covered by one or more colleges.

It seems to be universally conceded that the State Universities occupy more particularly the fields of liberal arts, law and medicine, and the charters of the leading universities speak particularly of those fields. The constitution of Texas provides for the establishment of "a university of the first class for the promotion of literature and the arts and sciences, including an agricultural and mechanical department," and the Land-Grant College of that State is by the same constitution declared to be the technological branch of the university. Nowhere have I found any inhibition against any of the universities offering work in any line of engineering, and the catalogs of the various universities show that they, too, are covering nearly all fields of engineering work.

Until recently, the universities and the colleges confined their activities to work within their own walls; but now their fields has broadened and they are all reaching out to render greater service to their several States; and three definite lines of work are now recognized as being the legitimate functions of both the universities and the colleges: First, thoroughly and well to teach students on the campus in all branches of learning; second, to foster and promote the spirit of research on the part of its own professors and instructors; and, third, to reach out over the State and render in all branches such public service as will tend to make the State better and more prosperous, and to help it in every possible way.

When we come back then to our first principle, that the field of the universities is that of liberal arts and sciences, and that the Land-Grant Colleges were established to promote interest in and knowledge of agriculture and the mechanic arts, the question at once arises, to what extent shall one institution be justified in duplicating the engineering work of another institution in the same State. This question has received a great deal of attention in the past several years, but I think no argument has been brought forward strong enough to refute the following statement, which I copy from the report of the United States Commissioner of Education for 1912, "The waste due to duplication of faculty, equipment and building is frequently overestimated. While it may be temporarily noticeable in weak, new commonwealths which have distributed their institutions, the permanence of this defect in a given state system will depend largely upon the rapidity of the growth of population and the upward reach of the work

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undertaken. The work done at the present time by the three higher institutions supported by the State of Michigan, and the two supported by the State of Indiana would not gain in efficiency if they were all combined in each state in one place and under one management, while the economies would be confined to a few administrative salaries save by the process of centralization."

If each institution is to serve its State and its patrons to the greatest advantage, duplication in undergraduate work cannot be avoided, for both institutions must offer such fundamental subjects as chemistry and physics and possibly certain other subjects necessary to the proper development of its students. Frequently, too, both institutions find it desirable to offer instruction in the same branches of engineering.

I have found by observation extending through a number of years, that there are parents who believe in university education, and who under no circumstances would send their sons to a land-grant college; while there are other parents who, on the contrary, believe thoroughly in the education offered in the Land-Grant Colleges and who under no consideration would send their sons to a State University. I hold, therefore, that duplication in the undergraduate work in the various lines of engineering is absolutely essential, if the State University and the separate Land-Grant College are to reach the fulfillment of their highest endeavor and to be of the greatest use to their several States.

If then it is admitted that there is no inhibition against either the State University or the Land-Grant College offering undergraduate work in any or all lines of engineering, and if it is admitted further that the work within the college may duplicate the work of the university, the question naturally arises how could there be any objection to one institution duplicating the engineering extension work of the other.

Generally speaking, the engineering extension work of an institution falls under two heads; first, the extension of the courses of instruction; and, second, the carrying to the communities and industrial interests of the State the information available and of peculiar interest to them either by means of bulletin, special lecture or otherwise.

Naturally, if there is duplication in the teaching at the University and at the Land-Grant College there will be duplication in the extension of the teaching, whether it be by correspondence courses or otherwise, and probably the best way to avoid unnecessary duplication is for the two institutions to agree that where one institution is serving one community, the other will refrain from going into that community with the same character of work. When it come to the other branchs of extension work, there is no way to avoid difficulty, unless one institution voluntarily declines to enter a field already occupied by the other. Certainly it were wise for the authorities of the two institutions to agree among themselves just what branches or what lines should be entered upon by either.

I am informed that Kansas has a general principle, approved by its State Board of Administration, whereby the Land-Grant College devotes its attention to problems incident to the rural districts, while the University stresses the problems of the cities and large towns. In accordance with this idea the entire university engineering staff carries on technical work for the State Board of Health, while other departments carry on the work of the water testing laboratory. The University also studies most of the municipal electrical lighting problems and gives proper attention to all

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manufacturing industries, especially flour milling and a few other enterprises which are closely identified with the agricultural interests. The engineering staff at the Land-Grant College has very definite connection with the highway, irrigation and drainage problems and takes an active part in cooperating with agencies which have to do with the many extensive applications of agricultural machinery. I understand that this general division works very satisfactorily, and that the two schools are cooperating everywhere when there is occasion for it.

Ordinarily problems of the rural communities and the agricultural engineering problems fall naturally to the Land-Grant College, while the University takes care of the questions more particularly applicable to the more populous communities—such questions as municipal government, sanitary regulation and refuse destruction, and questions not ordinarily covered by the work of the Land-Grant Colleges. I find that such questions as sewage disposal for rural districts, the lighting of country homes, water supply for farms, gas engines and tractors, and the various engineering questions that arise on the farm are those generally looked after the Land-Grant Colleges. While there can be no particular objection to the State Universities handling similar questions, it appears reasonable at least to suggest that they refrain from undertaking the solution of these and similar questions which have already been assumed by the Land-Grant Colleges, and to confine their attention solely to questions pertaining more particularly to the larger communities.

THE CHAIRMAN. Dean E. S. Keene of North Dakota will continue the discussion.

E. S. KEENE. Owing to the peculiar conditions now obtaining in North Dakota, I have written a longer paper than otherwise I would have prepared; but certainly you are all interested in the condition which confronts us at this time.

Every institution maintained at public expense should return in usefulness the greatest amount of good to the greatest number of people. To apply this truism to our state educational system, every educational institution should offer courses of instruction such as will return to the State the greatest usefulness in citizenship to the greatest number of people. Furthermore, the cost for providing the necessary facilities should be the minimum, commensurate with the best means of instruction.

The educational system which has grown up in the United States and is recognized by many as the leading form of higher education, began when the Morrill Act made possible a type of useful instruction in agriculture and mechanic arts. From time immemorial the universities had presented a single type of education and when, after centuries of inbred weakness, circumstances demanded a recognition of industrial achievement, its encroachment was resented with indignation. It does not appear that the established universities ever had any inclination or desire to dignify the industries as worthy of professional courses of study until the Morrill Act became a law. At the dedication of the engineering building of the University of Illinois, Dr. Andrew S. Draper said:

"From the time when the light of the star of Bethlehem penetrated the darkness and superstition of Europe, fired the hearts and liberated the thoughts of the people, started the nations into motion, lighted the fire of revolution, and then set up the schools, the universities have been founded

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on three great bodies of learning, namely: theology, medicine and law. Down through the ages these learned and honorable professions have been the bone and sinew, the flesh and blood of the universities, the most potent agencies in giving freshness and virility to the world of thought. Our nineteenth century life has added other honorable professions to this great triumvirate."

Very conspicuous among the new professions added in the nineteenth century were those of engineering. Even after agriculture and the mechanic arts had risen "to the dignity of professions", they were not welcomed to company with the great educational triumvirate. It was only after the land-grant institutions had shown by their achievements the immense popularity of this new type of education that the established universities awakened to their desirability. There was little inclination to dignify either of these industries as worthy of professional courses of study, until long after the Morrill Act came into effect. When large sums of money were to be obtained and a rich endowment of land secured for mere establishment of such courses, they were made a part of the curricula offered; but in most cases the available funds were welcomed rather than the desire for service.

In lamenting this new order of things the late Harry Thurston Peck once said—"The time was when a university graduate was a gentleman and a scholar, but today there is some doubt whether the university graduate is a gentleman and a scholar or merely a sublimed tinker."

There are probably few things educational that have received more attention in late years than the innermost meaning of the Morrill Act, especially as to mechanic arts. It has become thoroughly recognized by the discerning and accepted as a fact, that mechanic arts means every form of mechanic arts and all of its developments. There are no menial and no aristocratic forms of mechanic arts. They may be dignified as various forms of engineering but they are all mechanic arts; just as agronomy, plant physiology and pathology are a part of agriculture. The professional courses of engineering are only general courses of technical subjects that are intended to cover among them as completely as possible the field of engineering. Industrial courses are those adapted to special industries and may be completely technical or semi-technical; again, instruction may be given only as service courses; in all cases, however, they are mechanic arts.

In those States where the Land-Grant College has been integrated with and become a part of the University, little difficulty has been experienced in correlation of courses of study; but in the State where the University and the Land-Grant College have been constituted as separate institutions, strife has arisen as was bound to be the case.

In North Dakota the state institutions are governed by a Board of Regents. Technical engineering is offered at the State University and also at the Agricultural College. At the University the work is confined to degree courses. At the latter institution, mechanic arts includes service courses, semi-technical courses and degree courses. The same faculty and equipment which serves the degree courses serves the others also. It has been the aim to supply such courses as will serve the greatest number of people at the minimum cost.

The Board of Regents, cooperating with the Federal Department of Education, has during the past year conducted a survey of the state educa-

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tional system with the object of assigning to each institution its future sphere of activity. The report of the survey committee has not yet been made public, but a preliminary report has been made to the Board of Regents. Early this fall its secretary publicly stated that—"in all probability the survey report would recommend that all professional engineering courses be taught at the State University."

The educational survey has probably so divided the work of engineering that in all likelihood it will recommend that the State University alone be given the privilege of granting degrees in mechanical, civil, electrical and mining engineering, the four general subjects under which might be classified every type of engineering endeavor. To the Agricultural College may be assigned agricultural and industrial engineering with the privilege of granting degrees in such branches as have direct bearing on agriculture.

This division is made regardless of the fact that engineering was established at the Agricultural College eight years before the State University deemed it worthy of consideration; that the State Constitution enumerates the mechanic arts as a portion of its field of instruction and mentions specifically civil engineering as one of the subjects that shall be taught; and that the Morrill Act grants to the Land-Grant College the right to teach mechanic arts in all its branches.

The Morrill Act, in establishing the Land-Grant Colleges, provided for two definite branches of industrial training "for the teaching of such branches of learning as are related to agriculture and the mechanic arts." "These stand in the law as separate and distinct types of education though not necessarily independent of each other." They are coordinate and of equal rank. Neither can be subordinated to the other. If agriculture is of college rank, mechanic arts also must be of college rank.

The fact that in 1862 a clerk in the United States Senate unwittingly and as a matter of convenience used the term "Agricultural Colleges" as a designation of the institutions provided for in the Morrill Act; or that the North Dakota Constitutional Convention named the institution "The North Dakota Agricultural College", in no way subordinated engineering (which is meant by "mechanic arts") to agriculture. There is nothing in the Morrill Act that can be construed as placing the educational standards that are applied to engineering below those that are applied to agriculture. There can be no question that every kind of engineering from the most elementary to the highest professional grade is closely and unmistakably a coordinate function of the Land-Grant College. Mechanic arts or engineering stands out clear and distinct and upon equal terms with agriculture.

Technical engineering, as we know it, was born of the Morrill Act and fostered by its bounty whether taught in connection with a university or a separate institution. The University of Illinois claims the first college mechanical shops and Andrew White in his autobiography attempts to prove that Sibley College was the leader in all technical education. He tells also with equal frankness of wrecking the State Agricultural College in order to keep intact the endowment of the Morrill Act.

Previous to the beginning of the present school year President Ladd of the North Dakota Agricultural College sent out a circular letter relating to the work of that institution in which appear these statements:

"In addition to the practical and professional courses in agriculture and home economics, there are to be offered degree courses in civil and mechanical engineering as growing out of agriculture and the industries. In

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civil engineering, the degree courses will be offered, with emphasis on road building, farm surveying, drainage, sanitation, irrigation and refrigeration. In mechanical engineering, there will be degree courses emphasizing farm mechanics, power machinery, farm machinery, mill work and industrial engineering in all its phases:"

From these statements it appears that general technical engineering will be taught only at the State University and that the B. S. degree of civil engineering, mechanical engineering, etc., may be given only at that institution, but that the B. S. degree may be given at the State Agricultural College in highway engineering, refrigeration or any other branch of industrial engineering; furthermore, that semi-technical courses will continue to be offered in power machinery, traction engineering, draftsman and builders, etc. and that, in addition, service courses will be presented in traction engines, forging, woodworking, etc. as has been the custom since the foundation of the college.

The inference drawn from President Ladd's letter is that road making, or, what is the same thing, highway engineeering, will be taught as a professional course, on completion of which the baccalaureate degree will be given, but not in civil engineering. Let us now see to what condition this will lead.

Sometime since there was sent out by the National Automobile Chamber of Commerce, a circular entitled: "Subjects for Inclusion in Civil Engineering Courses to Qualify for Graduates for Highway Engineering." It was prepared by Professor Arthur A. Blanchard, who is in charge of highway engineering at Columbia University. It sets forth a general course of civil engineering in which particular attention is paid to the history, investigation, design and construction of highways. Of course it includes the investigation of all materials and special features as in any way may influence their construction and maintenance as, for example, sanitation of streets, car tracks, pipe systems, highway economics, administration and legislation. It is an admirable outline for such a course and no doubt will prove a model of its kind. It will be noticed, however, that it is in a course of civil engineering in which the graduates receive a degree in civil engineering, such as is required by Federal Government and others who employ highway engineers.

Engineering is the development of mechanic arts and industrial engineering represents the specialized application of this development. A man receiving a degree in road making alone would find his services are not in demand, no matter what his ability might be, because the general requirement of road making is that recognized in the civil engineer. The Federal Government demands civil engineers as designers and superintendents of highways.

A B. S. degree in road making, following a college course in that subject, would not be recognized in the engineering world. It would not be recognized in the Office of Public Roads and Rural Engineering as a qualification equal to the degree given after a general course of civil engineering. In order to present this course, that is granted to the agricultural college as one leading to the B. S. degree, it will be necessary to conform to some such model as the Blanchard outline, so that its graduates may seek employment on equal terms with graduates from other institutions. In order to teach the subjects enumerated in this course in an acceptable manner, an able and numerous faculty must be maintained to present the subjects in

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professional form. Shops and laboratories such as are required in any course of civil engineering are a vital necessity, as well as such special facilities as the course demands.

In no less degree are affected the subjects of drainage, irrigation, sanitation, refrigeration, etc., when presented as industrial subjects. Sanitary engineering is only a specialized course of civil engineering. No sanitary engineer, holding a degree in that subject alone, can hope to compete with graduates who have made sanitation a part of a general civil engineering course.

In mechanical engineering, the industrial courses of power machinery, milling and all other phases of industrial engineering are so coordinated with the technical course that to teach the industrial subject in an acceptable manner requires the faculty and facilities necessary for the presentation of the technical subject into which it has developed.

The original conception of mechanic arts was solely industrial. From this humble position it grew immediately into technical engineering. It has broadened and expanded to include the technology necessary for any demand. It has provided the superintendents, directors and managers in every field of engineering, but it has failed in most cases to prepare the foremen, contractors or industrial workers in the fields of usefulness requiring the same technical knowledge in special fields.

If the conditions described go into effect, students pursuing the Blanchard course of study at the State University would receive the baccalaureate degree as a specialized course of civil engineering, and would be recognized by the Federal Government as competent road engineers. At the Agricultural College, graduates would receive the degree for the same course, but as road builders, because the University is given the sole right to present civil engineering as a professional course. It is quite evident that the distinction between industrial engineering and technical or professional engineering is, in effect, determined in the name of the institution.

It will be borne in mind that President Ladd's letter states that the Agricultural College will teach all industrial engineering, "milling" being mentioned as a specific subject. In the Northwest this is not only the leading industry but one that at the present time is of far more than passing importance. Milling is a specialized course of mechanical engineering, bearing the same relations to that general course as road engineering does to civil engineering. Graduates of such a course naturally desire to be known as mechanical engineers; but again the difficulty of the designation of the institution prevents proper recognition. Similar discriminations occur throughout the industries; the privilege is given to present the industrial subjects as degree courses, but the title by which the engineering world recognizes the subject is withheld.

It is the contention of the North Dakota Agricultural College that, being the Land-Grant College of that State, it has carried out the spirit of the Morrill Act in all of its work. Its engineering instruction has presented the mechanic arts as required by general workers, the artisans, the contractors and the professional engineers. In the assemblage of all of the arts, crafts and technicalities of the engineer, lies its greatest usefulness. It is the institution in which the spirit of industry is foremost, where all engineering from the simplest arts to the highest development of technical skill, rightfully belongs.

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THE CHAIRMAN. The paper dealing with this subject by Dean C. H. Benjamin of Indiana will be read in his absence by President W. E. Stone of Indiana.

THE APPROPRIATE FIELD IN ENGINEERING EXTENSION FOR THE SEPARATE LAND-GRANT COLLEGE AND THE STATE UNIVERSITY

BY C. H. BENJAMIN

I have always taken the position that university extension is not properly so-called and is not a function of the university unless it involves work of university grade. I am not now and never have been in sympathy with kindergarten and secondary work for universities, whether in the university or out of it, and believe that all extension work which is not of university grade should be relegated to the charge of those who are responsible for secondary work throughout the State, whether they be known as school boards, supervisors or what not. I feel that the university should take an interest in this work as it does in all secondary education, and perhaps should be consulted in regard to this general tendency, but that the actual administration and working out of details should be put where it properly belongs. This limits what I can say in the present discussion to those fields in engineering extension which correspond to the work done at the several colleges and universities.

Unfortunately in some of our states, the work of education has been divided between the State University and the Land-Grant College in a manner which is productive of considerable duplication and is hurtful to both institutions. Where this is the case, the same conflict in extension work must necessarily arise as in the curricula. Referring, however, to cases where there is a more rational division of the work, as in my own State, the problem is a simple one. In Indiana we have reached a general agreement by which certain branches of education are undertaken by the State University while agriculture and engineering are taught only at the land-grant institution. This leaves extension work, as far as engineering is concerned, entirely in the hands of Purdue University and means, as we understand it, merely the affording to those who can not come to college a certain amount of college education at home, assuming that, as far as it goes, one sort of education shall be as good quality and high a grade as the other. I can only regard it as unfortunate that in some States engineering is taught at the State University as well as at the Land-Grant College. I fail to see how the latter can omit engineering from its curriculum and carry out the intentions of the original act, while there are no obligations to teach engineering at the State University except such as come from past practice and precedent. Unless the two institutions in such cases can come to some rational agreement for the division of engineering work between them. I see no possibility of any rational division in the extension work. One is but a reflection of the other and must conform to it. Any attempt to degrade the work of the Land-Grant College so that it occupies an inferior position in the educational field is contrary to the spirit of the original act. The engineer who graduates from the Land-Grant College should have just as good an education as he who graduates from one of our older universities and the extension work should be of equal grade in both institutions.

W. E. STONE. Permit me to add a word to what Dean Benjamin has stated. It has always seemed to me that the most logical division between

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the work of the State University and the Land-Grant College should be made on the basis of their degree-granting departments or schools. A certain duplication in fundamental subjects, like mathematics, chemistry, physics, English, etc., is essential because they underlie practically all courses leading to degrees. To administer these in both institutions is in no sense unnecessary duplication. But to duplicate departments in which degrees are given, is in practically all cases unnecessary and undesirable. So far as I know, there does not exist in any state a sound reason why two state institutions should offer the same professional courses. One institution may give instruction leading to degrees in the arts, in law and medicine, and the other in like manner prepare for degrees in science, agriculture and engineering. For both institutions to give degrees in engineering or law or any other subject is wasteful duplication. The evident purpose of the opponents of our Land-Grant Colleges, to make it appear that the kind of education given in the latter is inferior, is greatly to be regretted. The Carnegie Foundation for the Advancement of Teaching has taken the attitude that instruction in the Land-Grant Colleges was intended to be of secondary character, and I regret very much to see any further crystallization of that idea in our states. I believe it can be maintained that instruction given in most of these institutions is of as high grade as that administered in many of those which style themselves "universities." Few of them have all the departments which belong to a real university and few have any more departments than have many of the Land-Grant Colleges. I see no reason for the assumption sometimes expressed that the Universities should teach one grade of engineering and the Land-Grant Colleges another. In each state its best endeavor should be exercised in one institution in any given subject, and what the logical subjects to be administered by the institutions we represent are, is, I think, well established by the law and by practice.

Incidentally, I will say that we have not attempted engineering extension at Purdue. It may be that we should do so, but such an undertaking should not be entered upon for the mere sake of publicity. Our engineering professors say, when approached on this subject, that a little knowledge is a dangerous thing, that the engineer has to do with the safety and lives of people and that it is not advisable to attempt to impart superficial knowledge of engineering to half trained persons. They hold rather that an engineer should have a well trained mind and not simply a smattering of knowledge which will induce him to assume the function of the engineer without the ability to perform it.

THE CHAIRMAN. The discussion will be continued by Dean F. E. Turneaure of Wisconsin.

F. E. TURNEAURE. Being connected with an institution where the Land-Grant College is combined with the State University, I have given little attention to this problem. I take it that it is assumed that both institutions are doing work of a college grade in engineering education—that is, both are provided with engineering faculties. The question is, if both institutions are to do extension work, shall such work be of the same kind in both cases?

I believe that the evils of duplication, in some cases, have been exaggerated. When we think of the expense of duplication we must bear in mind that whenever an institution reaches a certain size much of its work

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must be duplicated in any case, and such duplication often extends to all departments; hence where engineering is taught at both the Land-Grant College and the State University, the expense of duplication involved is likely to be less than is commonly thought. Unquestionably, in the case of expensive equipment, there will be considerable extra cost if all laboratories are fully developed in both institutions, and this is a point which deserves consideration. In extension work it would seem that there is a probability that duplication will involve larger additional expense than in connection with resident teaching.

It appears to me that the first point to consider in attempting to differentiate the extension work of the two institutions is the nature of the associated departments of the respective institutions. In the Land-Grant Colleges we have, for example, the presence of the agricultural department side by side with the engineering department, while in the University we have the departments of law and medicine. Wherever cooperation between the engineering department and the other departments of the institution is important, this factor would naturally guide the character of the extension work. In the Land-Grant College, for example, extension work in engineering should certainly cover all matters relating in any way to agriculture, such as highways, drainage, sewage disposal plants for creameries and cheese factories, and other similar problems. On the other hand, the engineering department of the University might be able to carry on to better advantage those lines of extension work relating more particularly to problems of city life. Of course there are certain to be many problems which can be handled almost equally well by both institutions, and unless the field is carefully divided at the outset there is certain to be much duplication of effort. Correspondence instruction is a phase of extension work which certainly ought not to be duplicated. It is expensive work, involving, as it does, the preparation of instruction papers on which a great amount of time must be spent. Furthermore, many years may elapse before the returns from correspondence course fees are of much financial assistance.

I am not altogether in harmony with Dean Benjamin's point of view that a college or university should not do work of sub-collegiate grade. That subject has been frequently discussed, and I hold that a university or land-grant college can often very profitably carry on work of sub-collegiate grade if there is no other institution prepared to do it. The short course in agriculture at the University of Wisconsin was developed years ago, in accordance with this principle, and has proved to be one of the most profitable lines of development that has ever been undertaken. The same principle holds true in extension work, especially in such work as is related to agriculture and the manufacturing industries. The college can very profitably carry on extension work of sub-collegiate grade until some other agency is better prepared to do it. Should such an agency be organized later, the college can properly transfer the work which it is doing. The development of industrial education is an important phase of educational development in which the engineering school can exert a very helpful influence, but it is quite likely that as this work is taken up more generally by industrial centers, the work of the state institution should be discontinued. On the whole, the particular institution which should carry on extension work will depend very much upon local circumstances. In some cases it will be the Land-Grant College and in some cases, undoubtedly, the State University.

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A. A. POTTER. The Association of American Agricultural Colleges and Experiment Stations should protest against the action taken in North Dakota. It should protest to the Federal Bureau of Education, and to the governing bodies of its several constituent institutions. No such division of work as is proposed should be permitted without protest, for to allow such a procedure would tend to weaken the entire Morrill Act system.

I do not agree with Dean Spence with reference to conditions in Kansas. There is no division of the extension duties between the State University and the Land-Grant College. The statement to the effect that the former is in touch with urban engineering and the latter with rural engineering, is without basis in fact. Such a division would belittle or minimize our work. At the Kansas State Agricultural College we are doing extension work with several hundred operating engineers, including not only demonstration work but actual service work. We are doing extension work in connection with flour mills, municipal electric light plants, natural gas properties, with practically every industry, urban as well as rural. We are publishing engineering bulletins of direct value and interest to urban as well as to rural communities.

In this connection it may be of interest to you to learn that in 1915-1916, 34,723 students were receiving engineering instruction at 133 institutions. Of these, 16,622 or 47.9 percent were enrolled in the 48 land-grant institutions; 5,147 or 10.8 percent in the 21 state institutions other than Land-Grant Colleges (these include schools of mines); 12,954 or 37.3 percent in 54 privately endowed universities, colleges and technical schools.

From the above it is evident that the 48 Land-Grant Colleges are preparing for the engineering professions one-half of the total number of students pursuing engineering courses in the United States. The 21 state institutions which are not land-grant institutions are educating barely one-tenth of the entire number of engineering students; and the land-grant institutions are playing now a much greater role in the preparation of engineers than are the 54 privately endowed institutions.

D. W. SPENCE. In regard to the statement that has been called into question, may I say that my information was so positive and clear-cut that I did not feel it necessary to verify it. I used it as it was given me.

A. A. POTTER. Should not the engineering division of the college section express its disapproval of the stand which it is alleged has been taken by the Federal Bureau of Education in connection with the relations between the State University and the Agricultural College of North Dakota? Should not its protest be forwarded to the Commissioner of Education? I do not understand that as yet it has been publicly announced that the Bureau of Education has taken the alleged stand, but that it has taken this stand seems certain. Hence I feel that we should draw up resolutions to the effect that the contemplated division of the work is absolutely opposed to the spirit of the Morrill Act and that they should be sent to the Bureau of Education as well as to various state boards.

HOWARD EDWARDS of Rhode Island. May I suggest that it seems unwise for this division to protest against action in any individual state? It may protest against action in general, but directly to protest in a specific instance will inevitably do more harm than good, because states'-rights ideas are quite as prevalent in the North and West as they were formerly in the South.

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Furthermore, I deprecate the direction of the protest to the Federal Bureau of Education, because it appears to recognize a control which that bureau exercises only indirectly, and which I should object to recognizing at all. The bureau's present function is simply to gather and disseminate information with regard to education, save in so far as it exercises a general oversight over the use of the Morrill and Nelson funds. It has no power to control the action of any individual state as, for example, in the matter of this proposed division in North Dakota. I do not believe that it is a part of its legitimate function to write an advisory letter touching administration in North Dakota; and I, for one, do not desire that it should have any such power.

With regard to the general matter of division between university and college, I thoroughly favor such an amicable arrangement in each state as may be made in accordance with local conditions, subject only to one general principle, to which I would hold tenaciously, namely, that the Land-Grant College and the State University are, in no sense, subordinate the one to the other; that they are two equal, coordinate powers; that it is incumbent on them as coordinate powers to serve the State in the best way possible for the benefit of all. Therefore I heartily favor an expression of opinion by this division as to the coordination of power and rank between these two educational establishments in the same State, and as heartily deprecate directing this resolution towards any one state.

A. Marston. Whether the Bureau of Education has or has not a right to exercise the power of making an education survey in our States, it is exercising that power. It has associated representatives of other institutions with it in its effort. Its power in each case seems to be derived from state authorization. Commissioner Claxton of the Bureau of Education is to discuss this very proposition before us on Friday afternoon. In his paper, an advance abstract of which he has permitted me to see, he outlines the various recommendations which have been made by the Bureau of Education, and one of them is practically the same as the recommendation stated here to have been made for North Dakota.

I hardly know what we should do under these circumstances, but feel that we can hardly do less than to protest against any action or recommendation which will tend to imperil the type of education provided for by the Morrill Act. Perhaps we should not say "North Dakota," or "The Bureau of Education"; but we should express our opinion in no uncertain terms.

Howard Edwards. I am quite aware that the Bureau of Education is seeking to enlarge its powers, that it is making these surveys, and that they have been made under some form of state authority. I would welcome a resolution directed to the Bureau of Education, protesting against its exercise of such powers, but not one protesting against its action in a particular state.

E. O. Holland of Washington. I am in sympathy with the motion and also with the point of view expressed by the last speaker. I think that the two are not irreconcilable. I suggest the appointment of a committee to review this matter and to report tomorrow afternoon.

On motion, the suggestion of Dean A. A. Potter (page 210) was referred to a committee consisting of President Howard Edwards of Rhode

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Island, and Deans O. V. P. Stout of Nebraska and L. S. Randolph of Virginia for future report (see pages 240-241).

H. W. Tyler. May I offer a resolution?

Resolved, That it is the sense of this division that in every State the land-grant institution should be expected to conduct work of college grade in both agriculture and mechanic arts.

On motion, the resolution was adopted.

The President. "Mechanics Arts of Sub-Collegiate Grade at Land-Grant Colleges" will be discussed by Dean C. E. Hewitt of New Hampshire.

Mechanic Arts of Sub-Collegiate Grade in Land-Grant Colleges

By C. E. Hewitt

The Morrill Land-Grant Act created a distinctive type of institution for higher learning, which, among other things, sought so to adapt its curriculum that local needs might be met. Hence, while in certain fundamental subjects the land-grant college curricula are alike, in non-fundamentals they are apt to differ. Thus, for example, Nevada very properly teaches mining, whereas for obvious reasons the New England colleges do not. This paper deals more particularly with conditions met in the writer's New Hampshire experience, which he believes, however, may not be entirely foreign to those obtaining elsewhere.

Time was when business men held that a college course bore little relation to practical affairs, when the colleges felt that the business world was but remotely related to academic interests. This situation is changing and educational institutions are studying into business matters. For example, "big business" now recognizes the value of the work done by the Harvard Bureau of Research, established in 1911. This bureau has been investigating market distribution with special reference to the retail trade, the particular commodity taken for study being shoes. Shoe dealers, realizing that the conclusions which may be drawn from the collection and comparison of the records of many retailers might be helpful, were willing to furnish the needed data. As a result, the Harvard system of accounts for shoe retailers has been adopted by several hundred stores, many of which heretofore had used no sort of accounting system. For example, several retailers did not charge their business with their own salaries; several owning their stores failed to charge rent; others kept no books whatever save a memorandum of due bills; many could not tell what their annual sales totalled. The bureau's uniform accounting system enabled many retailers for the first time to know where they stood and to get their businesses upon firm bases. Similar research into the situation as related to the grocery trade has resulted in the formulation of a system of accounting for retail grocers that is being widely adopted. And other problems, for example, the creation of a model stock keeping system, are in hand. All retailers are interested in such efforts designed to standardize the retail trade and to establish definite principles for its guidance, since they tend to make their enterprises more certain and failures less probable.

The Land-Grant Colleges have always realized their great practical possibilities. Indeed, Senator Morrill himself probably had them in mind when he prepared the two Morrill bills.

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The Legislature of 1895 authorized the establishment of a two-year course in agriculture at New Hampshire College. It has proved very helpful to many young men who were either unprepared or financially unable to enter upon a four-year course. Its graduates, having spent two years of life in a college atmosphere, are on that account more successful farmers and better citizens. Seventy-seven percent of them are practical farmers within state borders.

Since it has been possible to perform so signal a service for farm boys, the query naturally arose whether the doors of the New Hampshire College might not swing open to young men interested in industrial arts; whether it was not in duty bound to offer every facility to this important work, to contribute so far as possible to the benefit of the whole State. The number of our industrial workers greatly exceeds that of those engaged in agricultural pursuits. There are 80,000 operatives in our shops, mills and factories and our output totals $164,000,000. So large a number of people, so vast a volume of business, command our attention and incite our desire to serve along definite and practical lines.

Commercial prosperity depends so largely upon the skill and well being of wage earners that more must be done for them than has been done in the past. Opportunity must be afforded them to increase their efficiency and to better their chances in life. This social obligation cannot be avoided by our colleges.

It is stated in the admirable report of the Committee on National Aid to Vocational Education that the American manufacturer has prospered in the past because of four factors, namely: the abundance and cheapness of raw material; the inventive genius of our people; our organizing ability leading to production on a large scale; and the great body of cheap foreign born labor of the first generation, working its way upwards in our midst towards civic and industrial worth.

President E. T. Fairchild of the New Hampshire College, in an address before the legislature, setting forth the advantages to be derived from the inception of a two-years industrial course in engineering, said: "With the opening of new sources of supply in foreign countries and with the gradual depletion of our own virgin resources in many lines, our advantage from an abundance and cheapness of raw material, at least so far as respects commercial competition, is a decreasing one. We cannot continue to draw indefinitely on Europe for cheap labor, nor will cheap labor in the immediate future meet the urgent demand in American industry for the more intelligent service necessary if we are to satisfy the rising demand for a better product for our domestic as well as our foreign markets. In the proportion that our resource factor fails we must increase the efficiency of human labor in the shop as well as on the farm.

The conservation and full utilization of our natural resources can be accomplished only in proportion as we train those who handle them. We must have an industrial education which will teach our workers in shops and factories how to use material without waste and how to turn the products of our forests and our mines into articles of higher and still higher value.

We have become a great industrial as well as a great agricultural nation. Each year sees a less percentage of our people on the farms and a greater percentage in the cities. Ordinary justice demands that this ever growing army of wage earners shall receive better educational oppor-

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tunities that have constantly in view the definite needs of those whom it is thought to benefit.

It is highly important to provide some form of vocational training for every young man who can afford to spend even a year or two beyond that which is required by law. The knowledge of a typical factory worker of today ordinarily goes no farther than his own operation or machine. He has little if any understanding of the relation of his work to that of others engaged in the same industry and no understanding of the business as a whole. Unfortunately, too, his conception of his duty to the community, the State and the Nation is often most limited."

Such a course should seek: first to increase the general intelligence of young wage earners and lead them the better to understand their social and civic duties; second, to increase their industrial intelligence and skill and to develop their capacity for adjustment within a given trade whenever opportunity exists, or, when it does not exist, to prepare for skilled and remunerative work in other lines. It seems fitting, in view of its special function in relation to state development, that the Land-Grant College should offer every facility to ambitious youth.

The success of such a course will depend largely upon the character of the work offered and the type of instructors offering it. No attempt should be made to furnish a professional training. It should be frankly practical, simple and fundamental, of the same sort as that offered in the agricultural short course. Yet a firm foundation should be built, one which imparts a knowledge of the underlying principles. The simple and pregnant facts of industrial history should be developed, leading to a consideration of present industrial conditions, social, ethical and economic. Manual dexterity should be sought as well as a primary knowledge of the business side of the work. Stress should be laid upon the need of cooperation and the mutuality of economic interests, of fellow citizens, the State and the Nation. And, finally, the student should be led to see the necessity of obeying the higher laws of health and sanitation in order that he may fully enjoy the fruits of his labor.

The great body of young men who annually enter our mills and factories possess as capital little save their muscular equipment; but their undeveloped skill and vocational possibilities are beyond computation. We may be able thus to help but a small proportion of this vast multitude, but the call is none the less imperative on that account. Such a course should appeal to and inspire ambitious but handicapped young men.

Those who take such a course will gain in manual skill and productive power; they will gather a certain store of industrial knowledge; better still they will acquire a certain initiative, a power of construction that will add indefinitely, to their earning power; and, best of all, they will find themselves. The atmosphere of the college will enlarge their views, give them vision, arouse ambition and make them leaders in their several occupations.

The needs of such men are sufficiently peculiar that it seems advisable to provide a special corps of teachers for this purpose. Instructors in the professional courses should not be asked to spend time and energy in teaching this grade of work, nor can they, as a rule, handle it successfully. It requires men with peculiar adaptations to deal with sub-collegiate work.

The sub-collegiate course in mechanic arts course at New Hampshire College includes:

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First year: industrial application of electricity, industrial physics, applied mathematics, mechanical drawing, shop work, practical mathematics, English, military science and drill and instruction in American citizenship.

Second year: industrial application of electricity, electrical controlling devices, electrical design, shop work, power plant design, economics of business enterprises, military science and drill, sanitation and hygiene for self, home and shop.

THE PRESIDENT. Dean W. N. Gladson of Arkansas will continue the discussion.

MECHANIC ARTS OF SUB-COLLEGIATE GRADE IN LAND-GRANT COLLEGES

BY W. N. GLADSON

The author of the Act which granted land in the various States for the founding of Colleges of Agriculture and Mechanic Arts evidently had in mind building such institutions as would give instruction in the mechanic arts as they existed in this country at that time. That improvement in the mechanic arts would result from such teaching, is a natural conclusion. In all probability no one at that time had any idea of the final development of certain lines of mechanic arts into engineering professions. This fact is evident from the general terms used in describing the subjects to be taught in Land-Grant Colleges. It seems from the wording of the original Morrill Act that the intention of its author was not to limit the grade of teaching in these institutions, but rather to outline broadly certain lines of instruction which should be carried out "not to the exclusion of other subjects." Therefore in the original act we have the authority to teach mechanic arts which are now considered to be of sub-collegiate grade. With the development of these colleges, the establishment and growth of manual training and continuation schools, and state legislation in many states encouraging industrial education, the question, "shall Land-Grant Colleges continue to teach mechanic arts of sub-collegiate grade," seems timely.

There is no sharply defined dividing line between mechanic arts of collegiate and sub-collegiate grade. Some high schools are teaching as advanced work in the mechanic arts as are some of our colleges, the essential difference being in the class of students instructed, especially in point of age and training in other lines. The high school student's general education is usually inferior to that of the average college student. If grade schools, high schools and all other institutions preparing students for college were of the same standard of efficiency and gave the same amount and character of training in the mechanic arts, and if all colleges receiving these students began their instruction in the mechanic arts at the same grade, we might draw a definite line which should mark the boundary between such collegiate and sub-collegiate teaching. However, this idea is not attainable even if it were desirable. The environment and wealth of schools vary widely in different localities as does the average age of the students in a given grade. Our preparatory schools are improving and pushing their instruction into the realm of the first years of college work. The ambitious college graduate who goes into preparatory school work is quite likely to want to introduce into his school instruction of a more advanced grade than has previously been taught, thus putting his school on the map and bringing

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himself to the attention of his board, forgetting, as a rule, that, as a result, important ground work is often neglected. Mechanic arts, from the very nature of the subject, may be begun as early in a student's training as his physical strength will allow him to handle tools and may be pushed just as far and rapidly as the student develops physically. Therefore, instruction which might be considered of sub-collegiate grade in one section of the country, would be classed as college work in another section.

In my opinion the ideal plan is to offer to every boy during his school days training in the mechanic arts of as advanced a grade as he may profitably undertake. If there are a sufficient number of properly equipped training schools and high schools in any state to offer instruction in the mechanic arts up to a certain average grade, then this should be the starting point for the land-grant college's teaching of mechanic arts, thus avoiding duplication and correlating the work of the public school system of which the Land-Grant College is the head. It is a well known fact, however, that there is no uniformity of teaching mechanic arts in preparatory schools any more than there is in colleges. For instance, an ambitious school superintendent in a town or city which liberally supports its high schools, will provide an equipment for manual training equal to that found in the colleges of the State and offer instruction of a grade equal to that given in the colleges, the only difference probably being found in the age of the students receiving the instruction. Other schools who maintain manual training departments, but whose superintendents and directors are more interested in other lines of teaching, will be satisfied if the boys spend a few hours a week in the basement destroying material with a few rusty hand tools. Students from both of these schools go to college and register for engineering work. If we begin instruction in mechanic arts where the student from the first school left off, students from the second class of school will suffer. Evidently then we must gauge our college work by the quality of raw material received; either admit that some preparatory schools do work in the mechanic arts of college grade or that colleges offer instruction in mechanic arts of sub-collegiate grade.

A division of the work might be made, the Land-Grant College devoting its time to teaching the more advanced subjects relating to mechanic arts of strictly collegiate grade, leaving to high schools, continuation schools and trade schools, instruction below college grade. In localities where schools of both classes are provided and sufficiently endowed and the work correlated so that progress of students might be continuous, such a plan would, I believe, be satisfactory. The schools of sub-collegiate grade would give valuable industrial training to many who are not candidates for a college education and who would otherwise fall into the common labor class. They would also, if properly conducted, inspire many boys to continue their education in college.

With the continually increasing numbers of young Americans who seek college training, the Land-Grant Colleges and other state educational institutions will become large and unwieldy unless branches are established in different localities, or students are taught by some form of extension. There is undoubtedly some advantage in keeping the higher education of a state under one management, but college presidents and boards of regents make mistakes, and the larger the institution, the more serious the result. This is a day of specialists and specialization, and colleges and universities

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may find sufficient outlet for their energies by confining their teaching to subjects of collegiate grade.

On the other hand many of our states, especially in the South and some parts of the West, have few or no industrial, trades or continuation schools, and a very limited number of high schools adequately equipped for teaching mechanic arts. Arkansas, the state of my adoption, may be used as an example among the Southern States. It is one of the richest in the Union in agricultural lands, but one of the poorest in farmers. It is no uncommon sight to see a harvester, thrashing machine or plow in mid-winter, standing unprotected from the weather in the field where it was last used. The single or double-shovel plow and one mule is too often the standard equipment in farm machinery. Some training in farm mechanics, even of sub-collegiate grade, would save our farmers thousands of dollars annually. Arkansas ranks third in the Union in timber products, yet it is difficult to obtain properly milled dry lumber for building purposes, and the average carpenter appears to have learned his trade on a farm with a foot adz and double bit-ax for tools. Seventy-five percent of the bauxite produced in the United States comes from Arkansas, but not one ounce of aluminum is refined there, notwithstanding the fact that thousands of horse-power of hydraulic energy are uselessly rolling rocks and eroding the banks of a stream 20 miles from the bauxite mines. We are shipping our natural resources out of Arkansas in the form of raw materials, for want of skilled artisans to manufacture them at home. In our state, as well as in others, where there are practically no manual training schools, many of the present generation of school boys are going into vocational employment without special training. The parents of these boys pay taxes to support the Land-Grant College and are entitled to its benefits and privileges. Should we not then provide instruction at these colleges to meet the educational demands of this class until state or privately endowed schools are developed to furnish the training?

The University of Arkansas was originally established as the Arkansas Industrial University and has maintained from the beginning mechanic arts courses in which instruction of sub-collegiate grade is given. We do not find that the presence of these sub-collegiate students on the campus interferes in any way with college work nor does it influence the teaching of collegiate classes. On the other hand a considerable number of the mechanic arts students, after finishing one or two years in a trades course, make up their entrance deficiencies and register in a college course. Others enter trades. One man, for instance, who completed a two-years course some eight years ago, is now a successful contractor in Kansas City, doing municipal contracting. Many others have succeeded as manufacturers, agents, general contractors, electrical supply men, and automobile machinists operating their own shops. We have taught these men not only mechanic arts of sub-collegiate grade, but other sub-collegiate subjects as arithmetic, algebra, geometry, trigonometry, physics and English.

The object of the Land-Grant Engineering College is to train men for a useful citizenship. Deriving our support as we do from taxation of all the people, we should endeavor to do the greatest service possible for the largest numbers. Colleges in the past have been in a great measure institutions for the instruction of the preferred class. This is not in accordance with the democratic spirit of the Land-Grant College. We should gauge our instruction in the mechanic arts to the demands of the masses of our

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people; and if this demand calls for sub-collegiate instruction in mechanic arts, it is our duty to provide it.

THE PRESIDENT. The discussion will be continued by Dean A. W. Richter of Montana.

A. W. RICHTER. I heartily favor secondary instruction, both in the University and the high school, provided it does not lead the student to believe that it gives him a preparation for college work. I believe that is a grave danger.

The shop in the Butte schools probably rivals that of almost any state institution. The pupils do splendid work. Their mechanical drawing compares favorably with that which we secure in colleges. But we do not believe that the preparation which is given in this type of work is equal to that which a student obtains in, for example, high school history, Latin and mathematics.

It is sometimes claimed, in colleges where no secondary work is done, that the mere presence in the curriculum of secondary courses tends to lower the standing of its collegiate work, to depress the registration and to embarrass the full-time graduates. I need not say that such a claim is unwarranted.

It is said that a little knowledge is a dangerous thing. The engineering department of the University of Montana began its secondary work a few years ago in connection with a railroad. The railroad employees were much interested in the work and so were the railroad officials. It seemed beneficial to both employee and employer, and had no ill effect upon the college work; indeed it advertised it and was a benefit rather than an injury. One year ago we began to train men who wished to take state examinations as stationary engineers. Since the State requires such examinations, we deemed it our duty to prepare young men to take them. Three examinations are required, so, naturally, we inaugurated a three-year course, lasting six months annually. The work is offered during the academic year. We have succeeded in separating the secondary work from that of college grade. The two classes of students do not mingle in the classroom or otherwise, yet there seems to be a kindly feeling between them. The secondary grade students understand that they are not doing work of college grade, that they cannot become engineers in the full sense of the term. The "license" course seems to be successful. Much interest is taken in it. The young men who have taken the years' work and, also, the state examinations, have successfully passed them.

We offer a new course in mechanic arts, a three-years course, six months annually, for young men who wish to do their own repair work on the farm, or who wish to become shop foremen or electrical workers. We cannot yet evaluate this course.

Our secondary work has been practically of the same nature as that which was outlined by Dean Hewitt, with such changes as would make it apply in one case to the work which is required of licensed stationary engineers, and in the other case to the work which is required of those who expect to become farmers.

We have found, on the whole, that our secondary work was very profitable to the faculty. It is a good thing to call upon college instructors who teach the regular engineering work to teach secondary grade work as well,

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to deal with men who have been thinking of their problems all their lives and are ready to ask many questions relating to their work.

THE CHAIRMAN. The discussion will be continued by Dean E. S. Keene of North Dakota.

E. S. KEENE. From the very beginning, our colleges have desired to offer technical courses; and in order to attain professional standing, to enable their students to secure positions in competition with graduates of any other institution, these courses have had to be of full collegiate grade. College catalogs are critically compared by would-be students and choices made accordingly. Therefore, all colleges of our sort—and others—offer technical courses of study, whether they are or are not well equipped for its purpose.

There seems to be a desire to jump from elementary mechanic arts to the highest form of professional engineering. The middle ground is rarely touched or considered. The day has gone by when we can graduate hundreds of technical graduates yearly and give them jobs. These jobs are not now as plentiful as they were. There are now more technical graduates than jobs. In the meantime, here is all this territory, between the lowest and the highest forms of mechanic arts in almost all our institutions, that receives little or no consideration. The apprenticeship system is gone, never to return. Where are boys going to find the means to earn a livelihood? There is no institution in North Dakota where a boy can learn a trade; it may be so elsewhere. The Land-Grant Colleges must take hold of this situation and work out the problem for their several States.

In some respects we have succeeded in meeting this situation. I am not sure that all institutions will be in a position to do what we have done. But we who are west of the Mississippi, have a right to teach everything from blacksmithing to machine shop work, traction engineering and steam engineering work as well as technical engineering. In all that territory the Land-Grant Colleges should offer sub-collegiate or semi-technical grade instruction of an engineering nature. These courses may and do include power plant engineering, the semi-technical training required by draftsmen and contractors, the preparation of electrical artisans for work in the care, repair and management of electrical machinery, and many other forms of useful effort that constitute neither trades nor professions.

In Fargo, North Dakota, there is a school of automobile engineering; but nowhere else in that State is there offered a course of study required by men who have opportunity to establish repair shops and garages for automobiles. Attempts are being made in many public schools to establish just such courses as ought to be a part of the engineering work of the western Land-Grant Colleges.

THE CHAIRMAN. The discussion will be continued by Dean R. L. Wales of Rhode Island.

R. L. WALES of Rhode Island. The experience which I have had in sub-collegiate work has left certain definite impressions on my mind. This whole matter should be considered in two distinct phases, namely, the so-called short-course work and extension work. The latter enlists my hearty support and enthusiastic hopes; the former is my despair. I speak from personal experience which possibly has been unlike that of others.

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I hope that no one will infer that I am not responsive to the rights of those who have not had the advantages of a college course. Certainly I am not a disciple of that school of intellectual aristocrats who fear lest they soil their fingers by reaching down into the shops to help those there to rise. Personally, I am democratic in my views. I cannot concur in the idea that has been expressed that the engineering college has no right to undertake work of a sub-collegiate grade. We would not be fulfilling our full functions under the law if we dealt only with the higher technical courses and if we absolutely neglected that other and possibly more important field which is the subject of our discussion. My whole thought and contention are directed to the solution of the problem of how this very desirable end can best be accomplished.

You will all admit that for work in engineering of any grade, some sort of a foundation is necessary. It may take the usual shape of formal high school training in elementary mathematics, physics and chemistry; or it may take the form of the practical knowledge of men and things acquired by the rough knocks of shop experience. Which type of foundation is preferable I do not say. Personally, I believe that both are necessary to the development of the engineer.

We can divide those who apply for sub-collegiate training in engineering into three classes.

There are, in the first place, those who have had this more or less formal preparation I have spoken of in high school. Very few such men apply for the lower grade of engineering instruction. They have usually reached the point where they see that it is possible and desirable as a business proposition to continue in the line in which they have started, and obtain a complete college training.

There are, in the second place, those people for whom sub-collegiate work should really be designed—those who have lost their opportunities in early youth and have been compelled by force of circumstances to forego a formal training and to go to work. These people possess, not mathematical, physical, theoretical knowledge, but an actual, sound, practical knowledge of things acquired by hard experience. Such a knowledge is a type of foundation for an engineering course. The unfortunate thing about the situation, however, is that in the course of acquiring this foundation these men have usually taken upon themselves duties and obligations which make it absolutely impossible for them to abandon their jobs and to spend two years away from their homes and employment, in carrying out any formal course of study. Consequently this class is practically eliminated from this type of sub-collegiate work.

There is, in the third place, the class which most commonly applies for the so-called short course work, made up of individuals who, through indolence, or possibly lack of capacity, have neither completed a high school course nor had shop experience. These men are imbued with the notion, which they have acquired somewhere, that by attending a technical school for two years they thereby will become engineers. We know that it is impossible for them to get anything like an engineering training under the circumstances and in that time; but somehow or other they cannot seem to get the proper point of view. My observation indicates that these men do not as a rule realize the truth of the situation until they are well along in, or perhaps through, their course. Then they see that they have been following a false hope; that they thought they were taking engineering

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when, as a matter of fact, they were taking something that was very different from engineering. They are disappointed and their instructors are disheartened.

Now these are the types which apply for sub-collegiate work. In my experience, two of the classes are practically eliminated from the short-course form of work, and the third class is not worth the effort that is put upon them, because they lack the foundation necessary to make that effort effective.

This is the situation. What is to be done about it? The short course idea seems to be impracticable. Yet we have in the second class of men much good, sound material—men who have not had the benefit of training, but who need it, want it and ought to have it. These men have lost their school opportunities, but they have secured good fundamental training with men and things. Perhaps they cannot solve problems in calculus, but they often know more about some particular phases of engineering work than we do. On account of their lack of theoretical training, they have reached the sticking point in their particular specialized line of endeavor.

It seems to me that the engineering extension service, that second phase of sub-collegiate work that I mentioned at the beginning of my remarks, is just the channel through which we can carry our engineering training to the particular men who need it and who will profit by it. Here is a man who through his experience has come upon some definite problem, or who wants assistance along some definite line of work. The university man through extension work can fill that particular need, not by asking the man to give up his job to take some more or less formal course covering a lot of unnecessary ground not closely related to the subject of his chief interest, but by taking the desired specific information to the man. If, as it appears, it is not feasible to bring the men to the work, the work should be taken to them.

I know of no type of training which is so direct, and consequently so efficient, as this extension work in engineering. This is why this phase of sub-collegiate work enlists my hearty support.

We tried short course work for several years in Rhode Island, with the experience that I have indicated. We also tried extension work in an informal way, having no funds available for this service. What was accomplished was done simply on the initiative of some of our faculty, but the results were very promising.

W. F. M. Goss. My purpose in attempting to discuss this paper is to voice a note of caution. I recognize the fact that the problem as it is presented to the Land-Grant Colleges of the several States is one of varying character. The problem of the West is not the problem of the East. Each institution must meet the requirements of its situation. While I am much interested in the development of sub-collegiate work as it is described, I question whether the support of such work constitutes a good use of the resources which are given for the development of engineering education in the Land-Grant Colleges. The Land-Grant College in most States should uphold high ideals of engineering education. If they do not do this, the ideals will not be established. There is no other instrumentality which in every community can do it. If they sacrifice this chance and commit themselves to work involving greater numbers of students, but of lower grade, and by so doing permit the absorption of their resources, a great chance is lost.

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Again, is it necessary that this sub-grade work be done? If it were not done by the Land-Grant Colleges, what would the young men who are profiting by it do? The answer to this is, I think, plain. I fancy that many of them would go on with their high school work, and I am of the opinion that in the long run the educational effect created by the high school would be quite as satisfactory as that which would result from the land-grant sub-collegiate work. Even though a particular group of students to whom were denied the privileges of the sub-collegiate work should refrain from continuing in the high school and should prefer to enter early upon the work of self-support, and even though the number in the group were large, the educational loss would be small when compared with results produced upon a smaller number who would immediately and for many years to come profit by the maintenance of standards and ideals which would make the sub-grade work impossible in the Land-Grant Colleges.

It is well to keep in mind that many of our problems are of a temporary sort. In every community there are many things which need to be done. We are conscious of these needs, but it does not follow that the duty is upon us to attempt to do them all.

THE CHAIRMAN. Agreeable to the understanding reached earlier in the afternoon, your attention is now invited to be given to a discussion among ourselves of the paper of Dean Marston on the proposed legislation to establish engineering experiment stations (pages 26-33). The Chair is informed that Dean Goss has been asked to speak on this matter.

W. F. M. GOSS. In the discussion of the Newlands bill in the general Association this morning (pages 26-44), a number of different points of views were presented. I have the feeling that we are likely to become confused concerning the real issue. What is it that those of us who are interested in the progress of engineering in the Land-Grant Colleges desire to secure?

The Newlands bill, as originally framed, followed the lines of the Hatch Act of 1887, and presents, in my opinion, the safest and wisest form which can be given a measure designed for the purpose indicated. Objections were raised to the form of the bill, and its friends sought to amend it in order that these objections might be overcome. I raise the question as to whether these proposed amendments may not pass the line of safety.

This question is especially pertinent at this time, since just now engineering research and scientific research are terms to conjure with. Yesterday I attended a meeting of the National Research Council and became much impressed with the magnitude of the plans which are in the minds of men for promoting research, and it is perfectly easy for me to understand that many men, sincerely interested in the progress of the Nation, are ready to welcome all movements which promise to give useful results in scientific work. As a consequence, the proposed amendments of this bill easily find justification and very considerable support.

I desire now to emphasize the fact that a proposition to promote research regardless of the terms in which it is proposed is one thing, while a proposition to strengthen and upbuild the Land-Grant Colleges through research is distinctly another thing. Now the question is, is this Association primarily interested in the development of research, or is it interested in strengthening and upbuilding the Land-Grant Colleges through federal appropriations designed to support research? I have assumed and I shall

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continue to assume, that, regardless of our personal interest and sympathies, the purposes of this organization is to exalt the Land-Grant Colleges. For the present, I am speaking through the channels of the organization, and I am bound to emphasize this phase of the problem.

It has happened that a bill which was fostered by the Land-Grant College Engineering Association was in danger of falling by the wayside. Senator Newlands, whose name it bears, went to the newly appointed chairman of the newly organized National Research Council and said, "Here is a proposed bill. It is probably a worthy measure, but it does not seem likely to pass. If the National Research Council approves it, it would be well for its members to get behind the bill and help it through." The purposes of the National Research Council are to promote research, and its chairman, Dr. George Hale, after his interview with Senator Newlands, appointed a committee to determine what amendments, if any, could be made in order that objections to the bill might be overcome. It happened that the three men, who, as members of the National Research Council, were appointed to resuscitate the bill, were not representatives of Land-Grant Colleges or of this Association and as as consequence they did not at all have the point of view which many of us here entertain. It was this committee that proposed the two amendments which are now pending, the purpose of which is to provide federal appropriations to be expended by local boards to be organized in the several States under the general direction of the United States Bureau of Standards. If the amendments prevail the bill ceases to be a source of benefit to the Land-Grant Colleges. It provides for the establishment of a new institution for the administration of new functions.

I wish it distinctly understood that I am not necessarily hostile to a proposition of this sort, assuming that Congress desires to promote the research work of the country by such means. I do want it understood, however, that in so doing Congress does not definitely or specifically contribute to the upbuilding of the Land-Grant Colleges, and, as I have already indicated, the purpose of this meeting and of the organization which is here represented is to achieve for these colleges.

It will be recalled that by action of the general Association this morning, the whole matter has now been referred to its Executive Committee. That Committee, as I understand it, will be the judge as to whether it is possible to bring this bill back to its original lines and in that form to secure its passage. If it decides that it is probable that this can be done, further progress will be marked by the full support of the general Association. If it decides that it probably cannot be done, it seems to me that there is nothing which we can do but to await a more favorable opportunity. I am hoping that the outcome of conferences now pending will result in all parties in interest recognizing the legitimacy of a movement by and for the Land-Grant Colleges, and I shall hope that if a bill which provides for this can not be passed, the matter will for the present be dropped.

L. S. Randolph of Virginia. We do not seek to do ill-defined and extensive investigation, but to carry on research work in the interests of the farmers and small manufacturers of our respective states who are constantly asking us to help them. I look upon any attempt to interfere with this aim as I would on an attempt to impede our resident work. This

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proposed endeavor is as legitimately our work as is any of our classroom instruction. We simply wish to be enabled more extensively and more successfully to do what we are now doing and to answer calls which have been made upon us from the beginning.

H. W. Tyler. May I present a resolution which I have prepared?

Resolved, That it is the sense of the engineering division of this Association that the question of federal aid for engineering experiment stations is distinct from that of such aid to research in general.

We aim to rectify an omission in previous legislation favoring agriculture instead of both agriculture and the mechanic arts. We claim no monopoly of research or of federal aid, but we do not deem it our duty to ask aid for any other class of institutions or to seek a combination which would involve new questions as to an extension of federal support beyond the range of previous legislation. We do not oppose the development of research at state or private institutions and we welcome such development wherever the best facilities and conditions can be found.

In our judgment, however, the first obligation of the national treasury in the support of research lies towards those colleges which have been founded and developed under the national land-grants.

We deprecate delaying or radically changing the scope of the Newlands bill, which we regard in substantially its present form as an immediately practicable step in the promotion of research.

On motion, the resolution was adopted and the chairman instructed to present it to the general session during the further discussion of the Newlands bill (pages 52-54).

On motion, Deans W. F. M. Goss of Illinois and G. W. Bissell of Michigan were designated to lead the general discussion on the floor of the Convention in connection with the Newlands bill at the evening session (see pages 52-54).

On motion, a recess was taken until 2 P. M., Thursday, November 16.

Afternoon Session, Thursday, November 16, 1916

The division was called to order at 2 P. M. by the chairman, Dean G. W. Bissell of Michigan.

The Chairman. A paper will be read by Dean R. L. Sackett of Pennsylvania, on "The Field of Engineering Experimentation."

The Field of Engineering Experimentation

By R. L. Sackett

The field of engineering experimentation is bounded on the north by the funds available; on the south by the problems most insistent for solution in a particular state; on the east by the activity of the engineering faculty in research; and on the west by industrial and economic reaction to research.

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This remark contains certain elements of truth. In the abstract, the field of useful engineering research is limited by just these factors of funds, of local demands, of alertness by the faculty in finding new fields of usefulness, and of response by the industrial and economic constituency to efforts of this nature. It is safe to say that each engineering faculty of a Land-Grant College has been asked to undertake the solution of many problems for which it did not have means, men or equipment.

Perhaps we should inquire first whether the congressional acts upon which Land-Grant Colleges are founded empower them to cultivate the field of engineering experimentation.

The author of the Morrill Act could not foresee the progress which agriculture and the mechanic arts would make in the interval of 54 years between the passage of the original act and the present time. The wording of the original bill, which is repeated in the amendment of 1883, gives reasonable latitude for the development of new lines of usefulness, unless interpreted by unfair and unsympathetic minds. The purpose of the newly created college was stated thus: "The leading object shall be, without excluding other scientific and classical studies, to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

"To promote the practical education of the industrial classes in the several pursuits of life," it is necessary to keep up with industrial progress and to assist in making such progress. To invent and to adapt methods to new conditions seems a proper function in the promotion of practical education.

To improve the soil and to improve the seed for that soil have been accepted as legitimate lines of study in agricultural education. To discover how to improve the quality of the brick made in a given locality, or to find and to make public information concerning deposits of better material, is practical education in industry. To assist in the development of a better mechanical source of power for farm use is similar in purpose to the development of better stock for the farm. To test oil, kerosene and gasoline driven plows, to see which costs the least in operation and maintenance, is as valuable as to test the relative efficiency of different animals under the same conditions. To compare the annual cost, service, repairs and upkeep of animal with mechanical power, would seem a rational field of investigation.

There has been no particular objection raised to experimentation in agriculture nor to its localization, as it is agreed that soils, meteorological, geological and topographical conditions, vary from one state to another so materially that one central bureau could not handle effectively and with intimate contact the great variety of problems presented.

Is a similar position regarding engineering experimentation logical or, as some contend, is there such a uniformity of materials and problems that a single testing station, located in New York or Washington, would serve all parts of the United States equally well and with sufficiently intimate acquaintance with and distribution of knowledge to those most interested?

There is a certain similarity of engineering problems, materials and conclusions, just as there are similarities in agricultural problems. But there is no greater likeness in the engineering questions that arise in different parts of the country than in the agricultural questions which are

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being urged for solution. A close analysis will show widely different questions and answers in the different geographic divisions of our country. The problems of the South are very different from those of the North. The North Atlantic States differ widely in a multitude of engineering features from those located on the plains, especially in the materials available. The North is interested in the use of concrete on the farm, good roads, the use of auto trucks and small tractors, in stream pollution by trade wastes, and also in the economic prevention of such wastes. The South is interested in swamp drainage, river control, levee construction, reclamation, pumping machinery, in cane and cotton harvesting machinery and in water power development. The West is interested in irrigation, devices for measuring water, pumping water, reclaiming alkali lands and in large tractors, heavy harvesting machinery, oil engines and electricity for farm use. The Pacific Coast States need engineering advice on a category of problem quite different from those of importance to their neighbors in the mountain districts.

The problem of the gas tractor for farm use is very different in Kansas from the same problem in Pennsylvania. One state is level with large fields of a rather uniform soil. The other is mountainous and rocky with a very different soil, small fields and relatively small farms. The type of tractor adapted to one is unfit for the other. If we consider adjacent states, Ohio and Pennsylvania, we shall find conditions very different. An automobile truck adapted to use over the level roads of one does not determine that it is suitable to the other. The materials available for concrete are very different in these two states. The problems in mining, in water supply for small municipalities, and of country roads are very different in the rocky or clay districts of Pennsylvania from those which arise in level, sandy New Jersey.

So far as it has been cultivated, the breadth of the field of engineering experimentation is best illustrated by examining the bulletins which have already been issued with the meagre funds and inadequate equipment of the engineering departments of several of the land-grant colleges.

One institution has issued 80 bulletins on a wide variety of subjects indicated by the following random selection of titles: tests of timber; tests of reinforced concrete beams and columns; the holding power of railroad spikes; tests of house heating boilers; smokeless consumption of coal; analysis of Illinois coals; the effects of boiler scale; locomotive tests.

Another institution has issued 51 bulletins of which the following are representative titles: tests of local sands for mortar and concrete; farm water supplies; sewage disposal for country homes; plumbing; boiler room operation; economy of farm tractors.

A third has published the result of experimentation on or the study of earth pressures on culverts; transmission of heat through insulating materials; staining wood by steam treatment; vocational education; heat treatment of iron alloys; electric lighting for country homes; concrete on the farm.

Other subjects from various land-grant college engineering experiment studies are: Minnesota stone and gravel for concrete road making; the effects of heat on Missouri granite; the protection of buildings from lightning; cost of producing power in Iowa with Iowa coals; road legislation and administration in Iowa; dredging by the hydraulic method; electric power on the farm.

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The wide variety of subjects already investigated may be divided into:

a. A study of local raw materials, such as clay, coal, sand, rock, timber and iron.

b. A study of fabricated materials, such as brick, concrete, glass, asbestos, iron alloys.

c. A study of machines and apparatus, such as house boilers, electric lighting, steam, gas and oil tractors, hydraulic apparatus.

d. A study of processing, such as wood staining, road making, pottery making, heat treatment of steel, etc.

Besides the diversity of conditions, not only between sections but between states, there remains an even more important reason for locating an engineering experiment station in each State. A part of the efficiency of each agricultural experiment station has been its intimate contact with the citizens of its own State and a clear comprehension of their difficulties. "Seeing is believing" as truly in rural engineering as it is in agriculture. There are state highway commissions which construct and repair the main arteries of travel. Few, if any of them, demonstrate to the farmer sufficiently to convince him how necessary it is properly to make and manitain a country road over which 50 percent of all produce must travel a mile or more on its way to market. An intimate contact with the man who knows, and demonstrations of how to maintain local roads, build culverts, mix and lay concrete, provide adequate drainage, are necessary to accelerate progress along economic lines. We have in each State a board of health, and in many instances their power is great. They do not act as engineers for cities but, rather, pass upon unsanitary conditions. Engineering experiment stations may do much work which is of an advisory nature and does not encroach on the work of the private engineer. Take such questions as the probable quantity and quality of ground water and its desirability for domestic, boiler and irrigation uses. Questions of sewage disposal for small communities are subjects concerning which an experiment station staff may give general advice.

The above discussion suggests two points of importance in the development of engineering experimental work at the Land-Grant Colleges. First, that many of the problems are intimately connected with agriculture and the interests of the farmer. In consequence there should be intimate cooperation between the agricultural and engineering experimentation staffs in the prosecution of such work and in the dissemination of the conclusions. Secondly, the most important engineering problems pressing for immediate solution are local and to these should in general be given first attention. Many of the subjects mentioned do not require research—using the proper definition of that word—but rather a practical study having for its chief purpose the economics of engineering and the application of well known principles to local materials and problems. After the pressing local problems have been solved, we may look for evolution in the engineering experimental field and the attack of truly research problems.

To define the field of engineering experimentation, then, seems impossible, further than to say that it may properly include the problems relating to engineering and industry involving the development of new processes, new materials, better methods and greater economy and the engineering problems of community life where they are not now solved by other forces.

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This definition is very broad; and thereby hang the chief dangers. These are two: first, conflict with national bureaus or state departments already in operation and jealous of their field; and, second, duplication of work.

Instead of conflict the wise director of an experiment station will cooperate with such forces. At Pennsylvania State College we are at present conducting an investigation jointly with the Bureau of Mines of the Department of the Interior and with the Department of Agriculture. There is the very best of cooperation and no duplication of work.

The possible repetition of investigations at different stations and the resulting increase in the expense have been discussed before this body. The criticisms are well understood. A clearing house is necessary where the work which each state has done and is doing will be recorded and the results of finished projects or of progress are available. A national bureau would seem to be the logical centre. Furthermore, a greater harmony of state and national effort would result, and at the same time unnecessary duplication would be avoided, if a national bureau was made the supervising office. Dean J. G. Scrugham of Nevada foresaw the difficulty and suggested both cooperation and the protection of the State from unnecessary interference when he said "I deem it very necessary to secure the federal bureau's support and cooperation. They must be shown that we will not infringe on their prerogatives and that the state engineering experiment stations will strengthen their work. A practicable system of cooperation must be devised in which the right of the State to select its projects will be recognized" (Twenty-Ninth Proceedings, p. 295). The latter clause is important since the initiative should come from the State in the solution of local problems. A federal bureau may very properly advise or designate a State to undertake a problem of interest to several States or to the Nation. The Newlands bill, introduced at the last session of Congress, places the supervision of the proposed engineering experiment station with the Department of the Interior, without defining the nature of the supervision or the function of the federal authorities in the matter. This subject needs further attention.

In conclusion, I may say that the definition of the field of engineering experimentation for the Land-Grant Colleges seems to be very well stated in broad terms in section two of the Newlands bill as follows:

SEC. 2. That it shall be the object and duty of said experiment stations to conduct original researches, to verify experiments, and to compile data in engineering and in the other branches of the mechanic arts as applied to the interests of the people of the United States, and particularly of such as are engaged in the industries; also to conduct researches, investigations and experiments in connection with the production, transportation, extraction, and manufacture of substances utilized in the application of engineering and of other branches of the mechanic arts to industrial pursuits; water supplies as to potability and economic distribution; sewage purification and its ultimate inoffensive disposal; economic disposal of urban and manufacturing wastes; flood protection; architecture; road building; engineering problems connection with transportantion, manufacturing, and public utilities; and such other researches or experiments bearing directly on the various industries and occupations of the people of the United States as may in each case be deemed advisable, having due

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regard to the varying conditions, resources, and needs of the people of the respective States and Territories.

C. E. Ferris. The engineering experiment station has to do with local as well as with state-wide problems; and when we begin to study the former we need to be associated with the agricultural experiment station people, for the reason that our local engineering problems are interwoven with the agricultural problems.

The last speaker has recounted many questions that confront the farmers, the building of roads, the care of household wastes, the purifying of water supplies; questions which are as much agricultural problems as they are engineering problems, problems which must be solved locally, problems best solved by the men of our engineering colleges working in harmony with the men in the colleges of agriculture.

There is ample opportunity for research in the big affairs of government. The engineer attacks the waste of the last generation and converts it into the raw material of this generation. These wastes abound everywhere. For instance, I have one industry in mind which daily accumulates 1,500 tons of broken stone, rich in magnesia, an excellent material for concrete purposes. Its economic usage is a big problem in Tennessee, covering a wide area. For every cubic yard of good Tennessee marble, perhaps five yards cannot be shipped; yet it is a valuable stone, if we knew best how to use it. When I contemplate the increasing usage of automobiles and the diminution of the liquid fuel supply, I dream of the time when we shall raise our supply of liquid fuel and of the South as the field wherein that supply might be raised. Its chemists, engineers and agricultural research men, working together, may find out how to produce cheap alcohol. There are water falls, water powers of immense size, available in the southern Appalachian region. Think of the possibilities, the potentialities of that power in the hands of the engineer and of the chemist who know how to make that immense amount of energy available to national uses. Surely the field of an engineering experiment station in each State is limitless.

O. V. P. Stout of Nebraska. In the discussions and treatises dealing with efficiency and scientific management, a term has frequently recurred which we can use in this connection; and that is "standardization." The field of engineering experimentation can be defined as the establishment of standards. Concerning "men, machines, methods and materials," we are to establish standards, standards of quality, of method, and of achievement or performance; standards by which these are to be measured, and by comparison with which we can obtain some idea as to whether in industry we are accomplishing what ought reasonably to be accomplished.

The field of engineering experimentation in relation to agriculture has been stressed. I believe it has been overstressed. I am distinctly a friend of agricultural engineering; but I query whether in connection with this proposed legislation for engineering experiment stations it should loom so large. If I may judge from my own home situation, agricultural engineering activities both deserve to and are able to secure support for experimentation. It is fair to assume that they will continue to receive such support. I contend therefore that under the new dispensation something supplementary, something entirely new, should be sought. I have held that

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the purpose of this bill is to do for industries other than agriculture what the agricultural experiment stations have done for agriculture.

We should not forget the reaction on instruction. One of the most wholesome and striking effects of this new work will be that it will bring students into contact with research work, that it will bring our departments in closer touch with our constituent industries, and through such connections bring our students into appreciative contact with these industries, and the industries into appreciative contact with our departments and the training which they afford.

Other terms may be derived from the same source from which I introduced the term "standardization." One is the idea of "line and staff." Our function in connection with our constituent industries is largely a staff function. One of the basic ideas of scientific management is enlargement of the importance of staff function, the enlargement of the personnel of the staff in industry; a reduction, on the whole, of the number of direct producers and an enlargement of the number of instructors, advisers and planners. It is largely, though not altogether, in preparation for this staff function that our work is consciously directed. We have argued that engineering training was perhaps the best training for executive positions in industry, but we will agree that to a considerable extent the type of man who fits himself readily into those positions is different from the type of man who becomes a professional engineer. The man who readily and rather completely assimilates the training that we are giving, belongs rather on the staff than in the line. The field of engineering experimentation, so far as subject matter is concerned, has been there all the time, but has been partly fenced off. The present tendency, the present ideas, including those based on scientific management and preparedness and the development of a scientific and technical staff, are in the direction of letting down the bars which to some extent have fenced off this field of subject matter.

THE CHAIRMAN. The Chief Engineer of the United States Reclamation Service, who is very much interested in this subject, is with us as our guest. May we hear from Director A. P. Davis?

ARTHUR P. DAVIS of Washington, D. C. I think it is scarcely possible to speak too highly of the suggestion embodied in the Newlands bill. There is hardly a better field, or one more needing cultivation, than that which this bill attempts to cover, of completing by federal funds, effort and sanction, the investigation leading to the betterment of methods and the increase of knowledge along the line proposed. No better selection could have been made of the hands in which to lodge the proposed investigation than those which have been conducting similar work in a much more restricted field, the Land-Grant Colleges.

It may be of interest if I review some of the possibilities or facilities of the United States Reclamation Service along these lines.

The Reclamation Service was organized about 14 years ago for the investigation and construction of irrigation works with the use of the funds received from the sale of public lands in 16 Western States. Since the passage of the original act, Texas, which has no federal public lands, has been added to the list, making 17 states in which the work is authorized. In 16 of these, irrigation works have been constructed, and there are now in operation works capable of delivering water to about 1,500,000 acres of land, about two-thirds of which is under actual irrigation. The works

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themselves comprise a large variety of structures, most of them hydraulic, and furnishing large opportunities for much needed experimentation to increase the knowledge of hydraulics. Of course other problems enter, such as the strength of materials. The works comprise, among other things, over 10,000 miles of canals, with capacities all the way from about 10 to 2,500 cubic feet per second; 382 miles are over 800 cubic feet per second capacity. These canals are located in almost all conceivable classes of soil or material; 242 miles are lined and many of them are partially lined. They are of all practicable grades. Many dams have been erected of loose rock, of earth, and of concrete or masonry. Five or these are over 200 feet high, three are over 300 feet high, and from that they grade on down to the diversion dam which raises the stream only a few feet. The masonry dams have a total content of 2,371,000 cubic yards; the earth dams of 9,685,000 cubic yards; the rock fill and other dams of 984,000 cubic yards. There are about 93 miles of dikes or levees. Structures on the canals number 19,648 of concrete, and 52,915 of wood. This includes those structures which are actually a part of the canal, such as head works, flumes, turnouts, drops ands various structures of that kind as well as bridges. We have altogether 5,184 bridges, with a total length of 116,000 feet. There are 6,426 culverts, with a total length of 217,000 feet. There are 1,873,000 feet of pipe used in the works already constructed. About one-third of the pipe is built of concrete, one-eighth each of metal and wood, and the remainder of terracotta tile. There are altogether 2,170 feet of flumes. You will see that while the field covered by these structures is not very comprehensive, the variety in the particular field is very great, and, within the limits mentioned, might be said to be practically comprehensive.

We have a large number of experiments already in hand, experiments and observations which are being made for our own uses. The available material and that which by a moderate amount of work might be made available, furnish us with much information which we have found to be serviceable and which might be made more useful to the general public if collected, digested and published. The reclamation act, however, provides that all expenditures made under its provisions are to be returned to the United States by the settlers who have benefited by the works. It is a peculiar act, about the only one I know of that limits the functions of the service to such things as can be properly charged to those using the works. Of course, to protect ourselves both morally and legally, we are careful to keep out any other charges. That makes it impossible for us to expend anything upon purely scientific work that is not actually required by the work itself as it progresses. A great deal has been done in that line, but even that has followed along special lines, and within restricted boundaries, so that it is not now sufficiently comprehensive, nor is it put in proper shape for publication, nor have we any funds available for its publication, if it were properly shaped. It has occurred to me, therefore, as proper, without in any way modifying the bill providing for experimentation and observations at the Land-Grant Colleges, to add thereto a provision for a small appropriation, authorizing the Reclamation Service to utilize its works for making available this information; and, without any reflection whatever upon any other existing works or upon any other existing organization, I do not think of any of them could equal or could go beyond the results that the Reclamation Service might obtain within a few years by using the same funds. Of course the field could be to a large extent exhausted.

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within a period of years, so that it would not have the advantages I mention after they had been fully exploited; but it will take a long time to do that, and of course we have not full knowledge by which we can realise the full value of these existing structures for experimental purposes. So far as we can, we are putting the information we have secured into shape for our own uses, and are standardising our structures. There are so many of them that we have been enabled as a result of experience gained to introduce great economies. We are getting together data and plans by which we are perfecting the standard plans under which these numerous structures are now being built, and to a certain extent always modifying, along the lines that seem best, the policies that we have pursued in construction work. For example, we now find that the flow of water in open and closed channels, as published in the books issued previous to our experience, is somewhat in error in two or three points. In general we have given our earthern channels too high a coefficient of roughness. The friction in roughened channels is somewhat less, and that in concrete channels perhaps as much greater, under ordinary conditions, than we judged it to be from the previous experience and the advice contained in the earlier engineering works. If we had all of our projects to build again we would largely increase the proportion of lined canal in order to prevent seepage, and otherwise to cheapen them. They could be built smaller, and many structures could be eliminated.

We have always been glad to cooperate with any one authorized to make experiments along the lines that our structures covered. Several have been made by the Federal Department of Agriculture in connection with its irrigation investigations. It is clear that the organization using the works and having years of experience with their use as compared with one not thus advantaged, is better equipped to get results, provided it has the proper authority and the funds with which the work could be directed along purely scientific lines.

THE CHAIRMAN. Formal discussion of the topic before us will be completed by Dean H. S. Boardman of Maine.

CONTROL OF ENGINEERING EXPERIMENTATION IN THE LAND-GRANT COLLEGES

BY H. S. BOARDMAN

The engineering experiment station, except in a few scattered sections, is of very recent origin. A report submitted to this Association in November, 1914, shows that 12 Land-Grant Colleges were at that time maintaining stations. Only three of this number had been in operation ten years or more, and the majority were only three to five years of age. Although during the past two years more or less progress has been made in the development of stations, there is still no organization which can coordinate the work and no national appropriation of funds. Some of the stations are given adequate appropriations by the State or college, but a large number have no special funds and so have not made much progress.

The agricultural experiment stations were placed upon a firm foundation by the Hatch Act in 1887, and were further endowed by the Adams Act in 1906. Since the establishment of these stations, their growth has been steady and their service has been great. It would appear that there is at least as large a field for the service of the engineering experiment

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station. It would also appear that in the establishment of a control of these stations, we may well benefit by the experience of the agricultural stations in their development. Both stations have many points in common, although the character of work is radically different. The work of each may be divided into two great classes—conservation and construction. The problems of each are nation-wide, although each state has many problems which must be considered by themselves and which are largely influenced by local conditions. An experiment station, unlike a state college, need not attempt to serve all the people but may confine its attention along more narrow lines and restrict its work to the study of a few problems in a thorough manner.

The Newlands bill, which was presented to Congress last spring, proposed that the control of each station should rest in the Land-Grant College of each State, subject to the approval of the Secretary of the Interior. Opposition has arisen from those who think that provision has not been made for adequate supervision and correlation of the work contemplated, and who claim that the funds will be largely wasted. Furthermore, in some states, institutions which are rivals to the Land-Grant Colleges feel that they should receive a part or the whole of the proposed federal funds.

In order to overcome these objections it has been proposed to create in each state an industrial research board, consisting of the Governor of the State, the Federal Secretary of Commerce and two members appointed by the National Academy of Sciences, this board to have full power to expend the appropriation and control the location and activities of the station. This scheme seems unwise for several reasons. In the first place, the likelihood of serious waste of funds is not great. To be sure, some waste will probably occur in making a start in some of the States where no definite steps have been taken for the establishment of a station, and other so-called wastes will doubtless happen. A movement of this kind, however, will develop the highest efficiency of service to the people, if it is allowed to adjust itself to the particular locality in which it is to operate. This adjustment can be made by a process of cut and fit under the direction of an institution of the type of the Land-Grant College much better than by the method proposed, where an iron hand would be likely to hold back every activity unless it appeared to be a good thing from a scientific standpoint. An attempt by any central governing body to dictate the policy of the different states in station work would be likely to result in a failure to adapt the work to suit the needs of the particular section. Extended scientific investigation controlled from a central source is a legitimate function of station work, but this control may be exercised by common consent of the stations acting together. These investigations, although of great importance, should be secondary to the consideration of local problems.

In regard to the supervision and correlation of the work we may again refer to the experience of the agricultural stations. The Office of Experiment Stations in the Department of Agriculture is the only federal relation which exists with these stations. It does not seek to control but, rather, to advise. It is in fact a great clearing house for the experiment stations of the country. Each station has its own control and works out its own problems benefiting by the work of all. Meetings are held by common consent for the purpose of exchanging ideas, but no action taken is held to be binding, but each station is informed of the work of the other stations and it is found that in many instances that duplication is advisable. This

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plan has been successful with the agricultural stations and it should work as well with the engineering stations.

In regard to the rivals of the Land-Grant Colleges in some states desiring to benefit by the bill, it would appear that their claim is not justified by past history. The Federal Government has never appropriated funds to collegiate institutions other than the Land-Grant Colleges. If it is decided wise to depart from this rule, it would appear unwise to frame a bill to apply to what is really an exception. It has been estimated that in four-fifths of the States, under the proposed amendment, the stations would naturally be located at the Land-Grant Colleges, and in the other fifth, where the State College and State University are separate institutions, it would go to the latter or the work would be divided between them.

Politics is almost sure to play a part under the proposed research board, which includes the Governor. The results of an institution trying to play politics have been disastrous wherever it has been attempted. In Maine, the endeavor has always been to eliminate political influence in dealing with the Legislature, and so far the University is considered non-partisan. However, Maine has had Governors who were distinctly antagonistic to the State University and who would not have been friendly to it. Under this scheme, then, in four-fifths of the States of the country, a situation will develop which will invite discord where friendly relations exist at present. If institutions other than the Land-Grant Colleges must be considered in the remaining States, the legislatures of these States should decide once and for all time which institution shall receive the grant. There is, however, no reason for taking this fight into peaceful territory.

Efficient work can not be done unless the station has a permanent home where it may develop year by year in the same manner as our agricultural stations have. To be sure, a laboratory in some other institution may be better equipped for some special investigation, but even then, let it be under the direction of the permanent station. Each station should, however, gradually accumulate its own working equipment as far as possible, for laboratories should not be the common working ground for both station and student use.

To sum up, it would appear that in the establishment of engineering experiment stations we may well imitate the successful organization of the agricultural stations, and vest the central power of each station in the directors of some engineering institution, preferably the Land-Grant College, in each State. A central advisory board should be established, probably in the Department of Commerce, which should be in the nature of a clearing house, and which should be only advisory in its function, except, of course, that it should see that the terms of the act are complied with.

L. S. Randolph of Virginia. The engineering experiment station proposition appeals keenly to me, for I have organized two such institutions for trunk line railroads and, having seen the effective results obtained there, I am anxious that our agricultural and industrial fields may be similarly benefitted.

Further developments in agriculture will be likely to occur along the line of the use of farm machinery. Engineering graduates who enter upon farming operations find their technical training of especial use in this connection.

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Engineering experiment stations are needed not only for purposes of investigation relative to questions of military preparedness, or of interest to the country at large, but in order that the small problems constantly arising on the farm, as to machinery, apparatus, etc., may adequately be solved; in order that the small industries, particularly those in which the farmer has direct interest, may possess a scientific laboratory sufficiently near them to which their problems may be submitted to the careful study of experienced men. Countless sums are lost or wasted by the use of inadequate machinery; industries have gone down for the lack of scientific advice, or of experimentation beyond the financial ability of their backers. For example, not long ago a sample of material was submitted to me which possessed all the chemical qualities necessary for cement; but we had no apparatus wherewith to test its cement-making qualities, the owner lacked funds and the matter stands today a possible but lost opportunity.

The main field of these stations is, in my opinion, that of the agricultural communities and the small towns, and not the prosecution of scientific studies of world-wide interest. The farm is a factory and should be treated as such, and its mechanical processes need careful study.

The private engineering experiment stations operating in the interests of our large trusts and corporations have advantaged them in comparison with their competitors. Many small plants go down in the face of such competition.

S. Fortier. According to the last census there are over six million farms in the United States, the average value of which is $6,444. This average value, including a mortgage indebtedness of $1,715, is made up of land valued at $4,476, live stock at $774 and buildings, improvements and machinery valued at $1,194. A consideration of these general average values of farm property reveals how large a part pertains to mechanics, the value of structures, implements and machinery compared with that of live stock, for instance, being in the ratio of 100 to 65. Enormous sums of money in the aggregate have been expended in the improvement of live stock and farm crops while relatively small sums have been expended for betterments in property pertaining to farm engineering. To my mind the original purpose of the Hatch Act should be carried out by a more general application of engineering principles and practice to agricultural pursuits.

R. J. Aley. The Land-Grant Colleges are supported by all the people. I should be very sorry if, when the engineering experiment stations are established, the major part of their energy should be devoted to serve the same class of people that has profited by the work of the agricultural experiment stations. We have not done much for the farmers thus far, except in comparison to what we have done for other classes of our citizens.

In this proposed measure, we have an opportunity to render good service to manufacturers and people engaged in industries other than agriculture. To my mind, the importance of the Newlands bill lies in this fact. Unless tax-supported institutions begin ministering to all the people instead of to a single class, a day of reckoning will come.

Maine is a rural state, and yet its manufacturing products exceed in value its farm products. Those engaged in manufacturing have a right to ask for help. They are as eager for help as are the farmers. We cannot at present meet their demands. I urge the passage of the Newlands bill because it will enable us to enter a new and larger field of service.

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C. R. Jones. West Virginia has approximately 100,000 farms and presents a fertile field for the experiment station along agricultural lines, but she is not classed as an agricultural state and the value of her farm products falls far short of the annual production of both her manufacturing and mining industries. The relative importance of these great industries vary in different states; in West Virginia, mining is the most prominent. We should, therefore, not unduly emphasize the agricultural side nor should we minimize it. Stress should be lain rather on the needs of each state for an engineering experiment station in order to promote all the industrial activities peculiar to itself, including agriculture, manufacturing, mining, transportation and communication. By making the purpose of the station general, it will aid agriculture more than if the work were confined strictly to engineering problems relating to agriculture.

L. S. Randolph. I am surprised to note how many manufacturers and farmers look forward to the establishment of these stations, feeling that they would profit by their work.

Our large industries owe their strategic advantages almost entirely to their strong research laboratories. They can make better products and sell them at less prices than can their weaker competitors who do not have access to extensive laboratories. The Standard Oil Co., for instance, pursues a line of research to the very end, discover new products and by-products, and new uses for old products. If small manufacturers and farmers had access to our laboratories, they could secure assistance in the solution of their problems and be enabled the better to compete.

I distinctly recollect seeing a Floridian, unscientific, untrained, blindly experiment for years attempting to utilize palmetto fiber. An engineering experiment station might have helped, or at least guided him.

A Delegate. In the beginning engineering in the Land-Grant College was a strong factor; then the agriculturalists became organized and developed their work successfully. Now their friends want everything done for the farmers; and they want the farmer's boy, no matter what his trend, to learn agriculture. Engineering in a measure is eclipsed. If we are to get this bill enacted, we must strike hands with our friends the agriculturalists. We must play up not the manufacturers' end but the farmers' end. The character of the work which an experiment station should undertake is a factor of the nature of the state's industries. Rhode Island's and Iowa's problems, for example, may well be very unlike.

C. L. Cory of California. The income from taxes in California is derived from a proportional tax of the income of the public utility corporations. The state support received by the University primarily comes from this tax. In other words, our people in effect pay their state taxes as a part of the cost of service rendered them by the public utilities.

The last speakers have well pointed out that the work of an experiment station must necessarily depend upon the principal industries in a state. Let me visualize this proposition to you by setting forth conditions existing upon the Pacific Coast and particularly in California. There is now actually developed and used between 250,000,000 and 260,000,000 horse-power, entirely generated from water power. The total cost of the hydraulic and electric equipment necessary to render available this power is approximately $100,000,000. It may be said that a horse-power is equivalent to

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the physical or manual work of ten men. Men, however, work 8 hours a day whereas, the hydro-electric plant may work 24 hours daily. In other words, in California with a population of about 3,000,000, the actually developed hydro-electric power will continuously supply energy equivalent to the work of 8,000,000 people 365 days in the year. Singularly enough the Chinese are still willing to use the human being to do all necessary manual labor, while the Anglo-Saxon people generally use their brains to develop the natural resources which are made to do this character of work for them.

What is the actual yearly cost of such hydro-electric power? Fixed charges, including interest, depreciation, etc., represent about 10 percent upon the total investment, and the necessary maintenance, operating costs, etc., an equal sum. We have, then, an expenditure annually of $20,000,000 which is the cost of the manual work which could be done by 8,000,000 people. As a machine, therefore, in competition with hydro-electric power, an individual is worth $2.50 a year, which, if capitalized at 6 percent, gives the worth of the man as about $40.

Another phase of this subject applies particularly to the West. Ordinarily 2,000 pounds of ore are mined, transported, crushed, and handled in order to recover the values therein contained, the weight of which will rarely exceed six pounds, and if the ore is gold not to exceed one ounce; and power is required to carry on all these operations.

A similar analysis is possible in agricultural pursuits. Every type of modern mechanism, such as tractors, automobiles, electric motors, and electric lighting appliances, tend to minimize the necessary amount of physical labor to be performed, and, of course, in competition with the human being these devices are far superior.

The manufacturing interests should support this proposed engineering experiment station plan. Engineering investigations would be of as great service to the farmer as an individual, directly and indirectly, as to the manufacturing enterprises. The agricultural problems of today increasingly are requiring engineering development, and it is but natural that agriculture and engineering should continue progressing together.

A. Marston. The Land-Grant Colleges were organized with a twofold purpose in view, namely: instruction in agriculture and instruction in mechanic arts. I take it that the field of these proposed engineering experiment stations is mechanic arts.

I cannot resist the temptation to take advantage of the opportunity to remind you that the Land-Grant College Engineering Association has already adopted an official definition of the term "mechanic arts," in the following words:

"The term 'mechanic arts' is not derived from 'mechanics' as meaning 'artisans,' but goes back to its use in connection with the laws of mechanical science, as distinguished from the laws of grammar, logic, philosophy, etc., which the ancients thought higher; an opinion not admitted by the moderns.

"A correct, concise definition of mechanic arts as arts is:

'The mechanic arts are those which are characterized by applications of the science of mechanics.'

"Examples of mechanic arts include manufactures, mining, the processes of working metals, woods, the ceramic materials, and the other materials of construction, and the design, construction and operation of roads, pavements, railways, bridges, water supply and sewer systems,

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power and lighting and heating plants, telephone and telegraph systems, buildings, harbors, canals and other public works, besides numerous trades."*

That is our definition of "mechanic arts."

Agriculture is to a certain degree a mechanic art. The farmer operates machinery of various descriptions, and the design, the manufacture and the operation of such machinery are really mechanic arts. If a farmer is operating such mechanical devices merely as an adjunct to the purpose of cultivating the soil and harvesting and marketing its products, the operation is agriculture; but if he should stop farming for himself and undertake to earn a livelihood by owning and operating these same tilling devices for other farmers for compensation in money, then his occupation would be a mechanic art. Indeed, agriculture may be said to be one of the most important of the mechanic arts and some of the most important fields for our engineering experiment station work are those branches of mechanic arts which are related to agriculture.

Iowa, for example, is an agricultural state. You could not buy the average Iowa farm for less than about six times the amount named here by Dr. Fortier as the average value of a farm in the United States. You could not put the improvements on the average Iowa farm for the total amount named by him as the average value of a farm in the United States. This subject is of great importance in Iowa. We have 105,000 miles of country roads, and are spending over $13,000,000 per year in their construction and maintenance. We are spending many millions annually for drainage. The manufacture of farm implements is of much state importance. Milling, the manufacture of cereal foods, of beet sugar, of packing house products, and of other farm products bulk large in our mechanic arts industries. All these are lines of experiment station activity which are properly included under the term "mechanic arts."

But the extent of our field is not bounded by these lines alone. It includes all manufacturing enterprises. We have stated the purpose of our Iowa engineering experiment station to include three special lines of work; first, the development of manufacturing and the kindred industries; second, the solution of the engineering problems of rural life; third, the solution of the engineering problems of urban life. Although Iowa is preeminently an agricultural state, about 54 percent of her people live within the limits of incorporated villages and towns, and work in their interest is properly included within our experiment station field.

This definition of our field has been sufficiently satisfactory to induce the Iowa legislature to provide the sum of $25,000 annually for our engineering experiment station work, an amount considerably larger than is now proposed to be appropriated by the Federal Government for each state.

In endeavoring to secure the establishment of engineering experiment stations at the land-grant institutions we are simply trying to round out our line of educational and research work so that all mechanic art industries shall be placed once more on a par with agriculture.

O. V. P. Stout of Nebraska. The industry with which we have come into closest relation at the University of Nebraska is that represented by the Brick and Tile Makers' Association. Its program last year was furnished mostly by the university departments, and it is now more interested

*Land-Grant College Engineering Association, Third Proceedings (1914), pp. 133-136.

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in and appreciative of our department of agricultural engineering than of any other department that has contributed to its program. That department has been working on the problem of permanent farm buildings, a line that relates very closely to the interests of the brick and tile makers; so it appears that even if we mean to make it our concern to deal with industries other than agriculture, notwithstanding we get back to agriculture. We can depend on the agricultural people taking care of themselves and of their interests. Yet, on the other hand, we shall make a mistake if we do not ourselves look after the interests of non-agriculturists.

W. F. M. Goss. If we can get our engineering experiment stations established, the service which they will render will, I am sure, prove satisfactory to the people. Justification is to be found in service rendered. In formulating our judgment as to the value of service rendered by an engineering experiment station, we must be controlled by a broad view. Service of the highest importance is not always immediate or direct. For example, the engineering experiment station of the University of Illinois has spent many thousands of dollars in investigating the laws governing the design of reinforced concrete. The results of these investigations have probably been of highest service to the great corporations, and especially to the railroads. It would not be unfair for the people of Illinois to ask why their money is spent in doing work which seems to be of benefit in the main to the railroads. The answer is not difficult to find. Any contribution to knowledge which will permit great corporations to increase the permanency of their structures or to reduce the cost of repairs, will ultimately contribute to their more economical administration, and economies thus secured must in the long run be transmitted as a return to all the people which the corporations serve. If the railroads are helped, the shippers will also be helped, the industries of the State served by the railroads will be helped, and the people who ride will ultimately be helped. The truth is that in this modern world of ours, a fact established is very likely to have a much broader effect than some of us at first suppose.

The report of the nominating committee was made and, on motion, was received and adopted (see page 167).*

The Chairman. The next order on the program is a discussion of "The Relation to Exist between the Land-Grant College Engineering Association and the Association of American Agricultural Colleges and Experiment Stations."

A. A. Potter. I sent out a letter canvassing the opinions of the various members of the Land-Grant College Engineering Association, and of others, regarding the desirability of retaining its identity as a separate organization. It is quite evident that the consensus of opinion seems to be in favor of retaining its identity.

Robert J. Aley. I can not conceive that the Association of American Agricultural Colleges and Experiment Stations will discriminate against mechanic arts that stand on a parity with agriculture in the fundamental

*The officers of the Land-Grant College Engineering Association for the coming year were elected, at the same time, as follows: President, W. H. S. Demarest of New Jersey; vice-presidents, J. G. Scrugham of Nevada and C. R. Jones of West Virginia; secretary-treasurer, A. A. Potter of Kansas; executive committee, the officers above named, together with E. E. Sparks of Pennsylvania, W. F. M. Goss of Illinois, and D. W. Spence of Texas.

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charter of all its constituent institutions. In most cases the college of engineering is on a par with the college of agriculture and in many cases, in the number of its students and in the strength of its faculty, it is the superior of the two. The larger body surely neither desires nor expects to discriminate. It is as sympathetic with your work as with that of any other line. Looking at the matter from the standpoint of a college executive, I consider that the legitimate place for this body is as a division of the college section. We ought all of us to meet together occasionally. We have many mutual problems. I have never understood why the engineers should have formed a separate association.

I am as much or more interested in engineering than in agriculture. I grant you that the Association of American Agricultural Colleges and Experiment Stations is poorly named. The suggestion made by Commissioner Claxton that it be called the Land-Grant College Association would be an improvement; but we have no authority to discuss that. I do not attend merely as the president of an Agricultural College, but as the president of a Land-Grant College, and I think that is true of most college executives.

I understand that another division of the college section has been formed, consisting of the heads of the home economics instructional departments in the various colleges. Frankly, I am appalled at the growth of the Association. Personally, I should like to have its membership confined to college and university presidents, the deans of agriculture and of engineering, the directors of experiment stations, and the directors of extension work. This Association should discuss, not the problems of the advancement of knowledge or mere academic questions, but the larger administrative questions in which we are all interested. This is not the place for members of the faculties. There are other associations that cover their needs, dealing with problems in which they are interested. This body of men now before me should constitute simply an integral part of the larger Association, a division holding its meeting as it has done this year, its proceedings printed as a part of the proceedings of the larger Association in regular course, on a parity with those of its other sections. I pledge you whatever influence I have that this division shall have all the privileges and all the opportunities and all the consideration of any portion of the larger Association.

A. Marston. The less we discuss or agitate this question, the better. We have received generous treatment and enjoy autonomy and liberty, having been made a division of the general Association without hampering restrictions or regulations. The Association of American Agricultural Colleges and Experiment Stations has not said that we shall not call ourselves the Land-Grant College Engineering Association. It has not said that we must change our constitution or list of officers.

The Chairman. The committee dealing with the suggestion made by Dean A. A. Potter of Kansas (page 210) will now make its report.

Howard Edwards. The committee reports in the form of a resolution, as follows:

Resolved, That the Association of American Agricultural Colleges and Experiment Stations, basing its action on the strong conviction that such measures as come within the scope of this resolution are contrary both to the letter and the spirit of the Morrill Acts, does hereby respectfully

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protest to the United States Bureau of Education against any action already taken or in contemplation by said bureau, tending to subordinate in grade or in scope the character of the engineering education offered by the land-grant institution in any of the States.

On motion, the resolution was adopted on the part of the division and referred to the Executive Committee.

HOWARD EDWARDS. The Land-Grant College Engineering Association seems to have still a coherent, independent existence, so far as it chooses to exercise the privileges of that existence. It earnestly supports and endorses this resolution. Let us assume that the Executive Committee of the Association of American Agricultural Colléges and Experiment Stations concludes not to report this resolution to the general session, What is its status?

E. S. KEENE. I supposed that this resolution was intended to embody the opinion of this body, not that we were asking for the judgment of the Executive Committee of the Association of American Agricultural Colleges and Experiment Stations as to our opinions. Dean Potter made a suggestion and then, in order to crystallize it, it was committed to be phrased as an expression of the opinion of this body.

THE CHAIRMAN. The reference was made in the belief that an expression of opinion by the Association would carry more weight with the Commissioner of Education than that of our particular division.

A. MARSTON. I understand that the resolution will be strongly supported by the Association. However, in view of the fact that this division will hold a session on Friday afternoon after the Association has adjourned *sine die*, we may then take up the matter again if we chose to do so. Indeed, we have a paper on our program which in a sense invites us to take up this very subject.

On motion, the division took a recess until 2 P. M. Friday afternoon, November 17.

AFTERNOON SESSION, FRIDAY, NOVEMBER 17, 1916.

The division was called to order at 2 P. M. by the chairman, Dean G. W. Bissell of Michigan.

THE CHAIRMAN. The first item on the program is an address by President R. J. Aley of Maine, on the subject "The Cooperation of Teachers of Agriculture and Engineering in the Agricultural and Engineering Curriculum."

THE COOPERATION OF TEACHERS OF AGRICULTURE AND ENGINEERING IN THE AGRICULTURAL AND ENGINEERING CURRICULUM

BY R. J. ALEY

The original act establishing the Land-Grant Colleges contemplated close cooperation between all the teachers in these colleges. In fact, cooperation of the teachers in the various departments of any institution is absolutely essential to good results. Desirable ends can hardly be secured if cooperation fails between medical teachers, law teachers, engineering

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teachers, arts teachers, and so on through the entire list. The institution has an interest in all the work that is going on, and that work cannot reach a high level unless that interest is cooperative.

Coming to the specific subjects or departments of agriculture and technology, we find that they meet in all our schools in several common, fundamental subjects, which open a splendid field inviting cooperation. Students in both of these colleges must, of course, study English, modern languages, history and economics, fundamental sciences and mathematics, and possibly some other things necessary to the development of a student in either field. The kinds of English studied are the same in both colleges. The modern language instruction should be identical, affording a working knowledge of some living tongue. Certainly in both colleges the students ought to know the fundamental facts of history and ought to have the power adequately to interpret historical facts. They should be made familiar with the established principles of economics, and the common facts of sociology. They should know the basic ideas of chemistry and physics as a foundation for the knowledge needed in either of the two fields. The elementary part of the higher mathematics is the same for both.

I believe that through these common subjects there might be a cooperation which would result in standardizing, or at least greatly improving, the methods of teaching. These subjects are to be the tools used in whichever field of work the student may decide to enter. Our students in agriculture and technology do not study English in order to become professional writers of English, but in order that they may learn to appreciate what is good in literature, in order that, by the study of composition and the understanding of the principles of rhetoric, they may be able to express themselves accurately, clearly, and definitely. They are not studying modern language in order to become philologists, but so that they may know at first hand the progress of their particular subject of study in other countries. And so with all these subjects. Therefore, it seems to me that the cooperation of teachers of agriculture and teachers of engineering is necessary to produce improvement in these fundamental required subjects.

There has been a tendency recently to adapt these fundamental subjects to special needs. We find in some institutions that the English department has worked out a course that is designed especially for agricultural students, and another specifically intended for engineering students. The same tendency is found sometimes in the modern languages, and in a good many cases, I think, in economics; less often, perhaps, in mathematics, chemistry or physics. These very specialized courses by cooperation might profitably be discouraged. The engineer or the agriculturist who can stand before an audience and talk so that we understand what he says is putting into application precisely the same sort of rhetorical principles and the same ideas in English that the diplomat uses when he is making a convincing argument. Good English, the ability to say what you mean so that it may be understood, rests upon fundamental and unchanging principles. I have little patience with the idea that you can train a freshman to write agricultural English or technological English. It does not often happen that he is trained to write even simple English.

There is great need in all of our Land-Grant Colleges for a standard freshman year. It would be of value if we could cooperate in the two colleges and establish a course for the freshman year that would be the

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same for both. There are some difficulties in the way, but they can be overcome. It often happens that a student who starts in one college finds by the end of his first year that there are things there that he did not know about, and becomes convinced that he should change into another field. It happens both ways. These movements should be encouraged rather than discouraged. We should try to make it as easy as possible for a student who gets into the wrong pew to find the right one. If the two colleges should cooperate in establishing a standard freshman year, a year made up of studies common to both, which it is recognized that all students in either field must have, it would result in a valuable educational advance. Few freshmen are ready to make a start in the field of scientific agriculture during the first year. In most institutions, there is not much real engineering work in the first year, mechanical drawing being usually the only subject of an engineering nature.

The cooperation between agriculture and technology would be greatly simplified, and all problems would be made very much easier, if the men of the two faculties knew each other better, more intimately, and each had some little understanding of the problems and of the field of work in which the other man is engaged. It would tend to reduce friction; it would develop confidence which would make the whole work of the university smoother, easier. Acquaintance removes many causes of friction. Charles Lamb was sitting one day in his London club talking to a friend, and there stepped into the room a man of considerable note. Lamb said to his friend, "I hate that fellow." He said, "You do? Why, he is a pretty good fellow. Do you know him?" "Oh no," said Lamb, "I don't know him. If I did, I wouldn't hate him." There is a whole lot of philosophy wrapped up in that remark.

As a result of the rapid development of agriculture and technology, our college curriculum is loaded with a large number of one and two hour courses. The fight against these short courses has already begun in many institutions and some of them have been eliminated. It is not necessary to argue against them. Without doubt, such courses are not worth while. It is too long between recitations. Students forget preceding lessons and lack interest. The faculties of the two colleges could cooperate here to good advantage in the elimination of many of these short courses. For a student to load his registration card with a succession of these courses is folly. He might as well buy a Chautauqua lecture course ticket. The subject changes too often. Emphasis should be put upon the long courses, the courses that are essential, the courses that embody the very core of the subject. In engineering there is already a strong movement against the short course. Leaders in this field of education are agreed that the emphasis should be upon the big fundamental topics. The student who knows these things will have but little trouble in mastering the details of some specialized development. The same is becoming true in the field of agriculture. There are many short minor courses that ought to be scrapped.

The agricultural college faculty has developed extension work to such an extent that it has been taken over by another division organized for the particular purpose. The demand is growing for extension work in the field of engineering, a demand as insistent as that for agricultural extension work, a demand that must be met. The agricultural faculty should cooperate with the engineering faculty by giving it the benefit of the experiences that have been found profitable in developing agricultural exten-

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sion work. The two fields may not be the same, the methods may not be alike, yet doubtless much has been learned in the older field that would be of advantage in the newer one.

We are all hoping that within the next year we may have legislation that will establish engineering experiment stations. Here, again, the engineers ought to seek the cooperation of members of the agricultural faculty to gain from them whatever experiences may be of profit. Many mistakes were made in the early days of the agricultural experiment stations. Many of these we may avoid in engineering if we will seek the cooperation and help of the men who have had the experience.

In the improvement of teaching there might be very great cooperation between the teachers of agriculture and of engineering. Those of you who heard Dean Charters' address on this subject (pages 177-183) will probably agree with him that the problems of teaching are not dependent upon the subject. The man who can teach English well, if you could fill him full of electricity, would teach electricity well; or if you could fill him full of a knowledge of agronomy, he could teach agronomy well; or vice versa. Teaching is a universal process, resting upon principles that are independent of the subjects taught.

College teachers are said to be the poorest teachers in the world. It is a severe criticism, but has basis in fact. We all know that some of the teaching in the schools we represent is of such poor quality that if it were done in a high school or grammar school it would not be tolerated. When we attempt to improve teaching in colleges, we meet the resistance of the college men themselves. You college deans know the resistance you meet if you make suggestions to a teacher, particularly if he be in the field of engineering in which you have not specialized. He will not admit that you know anything about teaching the subject and he will deny your right to judge. The cause of education is suffering because we resent the judgment of our work by the standards used in judging other work.

The faculties of agriculture and engineering might cooperate in establishing a reasonable time value. We all know men who have no appreciation of the number of hours in a day and who feel that their subjects are so important that they are absolutely essential. A man would not be worthy of a professorship if he did not believe his subject was important. He has no right, however, to think it so important that his assignments require an excessive part of a student's time. I remember when my son was in college he had a two-hour course in which he was required to do assigned work of from 22 to 25 hours per week. He was carrying 16 hours a week. If the requirements in each pair of hours in the other 14 had been as severe, it would have been necessary for him to have put in on his college work from 176 to 200 hours per week, or from 25 to 29 hours daily. Cooperation in this field might have as one of its results the development of a proper perspective on the part of the entire teaching force.

I still have faith that most students come to college with a serious purpose. I have little faith in the dictum of recent years that a teacher must fail a certain number, that so many must receive a low grade, so many a medium grade, and so many a very high grade. The law of averages may be all right in some fields, but so far as college students are concerned it should be greatly modified by the character of the teaching. Some years ago I asked an instructor as to the progress of a certain class. He said,

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"I have 35 in that class, and shall fail 28 of them." I said, "Is that a reflection on the class or on the teacher?" I left him without waiting for an answer. When the reports were in, I found that 28 of that class had passed, and only seven failed. I do not know what brought about the change of heart. Careful attention, consideration of principles, discussion with our fellow faculty members, may result in saving a much larger number of college students than are now saved. Sometimes a little careful teaching will adjust a student and he will find himself, whereas careless teaching would result in a complete failure and he would be dropped from the college rolls. The best piece of cooperation that can be done between the faculties of agriculture and engineering is cooperation in the improvement of teaching.

L. S. Randolph. There appears to be much demand for cooperation between the engineering and agricultural departments; indeed in some colleges cooperation needs must occur because of the necessity of jointly considering the locations in the hour plan of cultural studies taught in both departments.

W. F. M. Goss. The problem of effective teaching is one in which we have a common interest. Where the teaching organization is one of considerable size, there are many things that can be done which will improve the average quality of the work. We have found at Illinois that committee organizations, especially when made up of our younger men, having regular meetings which are devoted to the study of problems peculiar to a department or to the administration of a single subject, have been most serviceable. In a group of six or eight young men, there is likely to be at least one who has given sufficient thought to the subject to make him an inspiring leader. Our college of engineering has sought to discover also whether the expert staff of the school of education might not be serviceable in improving teaching in engineering. We have assumed that we of the engineering college are experts in engineering, and that they of the school of education are experts in education. We have raised the question as to whether we as teachers of engineering may not gain much by drawing to our assistance the summarized experience of the university's experts in education. An experiment is being worked out in connection with one of the departments of our college, the instructors of which are organized for group study under the general direction of an instructor from the school of education.

The tendency in university work is to segregate effort, whereas we need the broadest sort of sympathies. The college of engineering sometimes criticises the teaching which is done in general subjects, such as mathematics and language, which are administered by another college, but investigations have generally shown that the average quality of the service rendered in these other colleges is quite equal to that which is attained in the college of engineering. The spirit of affiliation has been promoted at Illinois in various ways. For example, the dean and faculty of the college of agriculture invited the dean and faculty of the college of engineering to be their guests on a certain Saturday afternoon, when the visitors were shown through the laboratories and barns and over the fields of the college of agriculture; and in due time the dean and college of engineering and his associates invited the instructors in the college of agriculture to be their guests, when the visitors were shown through the labora-

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tories, libraries and drafting rooms of the college of engineering. Such things as these undoubtedly aid in improving the quality of teaching.

R. A. Pearson. A year ago our department of education arranged for a special course of lectures upon methods of teaching, which would be open only to faculty members, one hour per week. The leading minds of neighboring institutions were invited to come in by turn and to talk on different phases of the question which had been assigned to them. We drew from the Universities of Chicago, Minnesota and Iowa, and the head of our own staff contributed. The lectures were well attended, the subjects were well handled and the course this year is being continued with some modifications.

As to the relations between different branches of work, we have tried to make some progress along that line by electing to regular membership, for example, in the agricultural faculty, certain members of the engineering faculty who have something to do with the instruction of agricultural students; and, vice versa. Three men are recommended by the one dean and accepted by the other dean, and the appointments are ratified by the board of deans; and we are careful to encourage attendance upon the other faculty meetings. Thus you see we get the experience of both faculties when either one is in session.

The Chairman. The next topic upon the program deals with "The Status of the Land-Grant College as outlined in Reports of Surveys Recently Made by the United States Bureau of Education," and will be presented by Doctor S. P. Capen, specialist in higher education of the Federal Bureau.

The Status of the Land-Grant College as Outlined in Reports of Surveys Recently Made by the United States Bureau of Education

By S. P. Capen

The relation of the Bureau of Education to the Land-Grant Colleges is of long standing. It is a statutory relation and as such perfectly definite. Through the limitation of its resources the bureau has not always been able to cultivate this relation to the full. It has, however, from year to year endeavored to meet its legal obligations more completely, and in this effort it has had the cordial support of the Land-Grant Colleges themselves. This old and rather formal relation between the bureau and the Land-Grant Colleges is perfectly familiar to your Association. It has, indeed, been several times discussed at your meetings.

Requests of various state official bodies during the past 15 months have brought about an altogether new relation between the Bureau of Education and individual Land-Grant Colleges. The requests referred to are those for higher educational surveys. The Bureau of Education has completed such surveys in the States of Oregon, Iowa, Washington, North Dakota, and Nevada since the last meeting of this Association. Surveys are also projected in five other States. In certain of these States, the Land-Grant College is separate from the State University. One of the purposes of the survey in such states has been to determine the appropriate functions and relationships of these two institutions; that is, to devise a remedy for expensive duplication of courses and departments. It is in connection with its recommendations on these matters that the Bureau of Education has

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made important pronouncements concerning the status of the Land-Grant Colleges.

First of all it has emphasized the complete educational equivalence of the work done in the collegiate departments of the Land-Grant College to that done in the State University, provided the entrance requirements and scholastic standards of the two institutions are the same. It has pointed out that States with separate Land-Grant Colleges have established what is substantially a university system operated from several centers. The following quotation from the report on the survey of educational institutions of the State of Washington (now in press) presents the bureau's interpretation of this situation:

"Unquestionably the State University was at first intended to be the ranking institution in the State. It was assumed that all higher training would center in it. But most State Universities were established before the differentiation of higher education into separate specialized fields of subject matter. Ths development has taken place within 50 years. The same period has seen the rise of the Land-Grant College. Land-Grant Colleges have indeed borne an important part in the great modern movement which has led to the elevation of applied science among the learned professions; they have contributed largely to the differentiation of professional lines which marks present-day higher education.

"In the beginning the Land-Grant College was undoubtedly not of equal standing wtih the University. In some States it is still on a lower academic level, but in States where higher education in both the applied subjects and the older scholastic subjects has been best supported and most wisely administered, the disparity between these two types of institutions has wholly disappeared. It should be emphasized that it remains with the institutions and with the States to establish the full educational equivalence of the Land-Grant College and the University. If the Land-Grant College has as high entrance requirements, as severe educational standards, and as able a corps of instructors, it is a university (no matter what it is called), doing work of equal rank with that offered by the University proper. More especially is this true of the Land-Grant Colleges which have developed graduate courses and encouraged research in the applied sciences. * * *

"Those states which maintain separate Land-Grant Colleges have in effect divided their universities and have created a university system. If they have been wise enough early enough to differentiate the function of the two institutions, they have assigned to one the liberal arts and the learned professions, to another the applied sciences and agriculture, or they may have made some other division; but, unfortunately, few States have possessed this wisdom. In any event it must be recognized that where a state university system exists instead of a single institution, the field of the university proper is likely to be abbreviated. This is entirely just and from the point of view of the State may not be a disadvantage. In fact, the existence of two or more institutions of collegiate rank undoubtedly increases the total number of students who avail themselves of higher education. Every institution exerts a strong magnetic pull on its immediate environment."

After the educational equivalence of the work in the applied sciences to that done in the pure sciences and liberal arts has been conceded, the problem of the State is to determine the distribution of the functions of the two institutions in accordance first with state needs and second with

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the equipment and location of the institutions concerned. The competence of the State to determine the function of each institution is clear. Even the federal grants for agriculture and mechanic arts are grants to the State and not to any institution of the State. The State has at all times the right to redistribute the allotment or to withdraw it, if it chooses, from any institutional beneficiary. The State is indeed expressly authorized by the terms of the Morrill Act to provide instruction in agriculture and the mechanic arts "in such manner as the legislatures of the States may respectively prescribe." State and federal courts have handed down decisions on this point too often to leave any ground for doubt.

The full authority of the State in the premises being admitted, the Bureau of Education has maintained that the determination of the field of each of the separate institutions should be based on a clear-cut conception of the justifiable extent of duplication. The bureau has discussed this question several times and has also enunciated a principle of differentiation. I quote from the report on the educational institutions of the State of Washington (now in press) and from the report on state higher educational institutions of Iowa which has just been published. In the Washington report the following statement is made concerning duplication:

"The word 'duplication' has become a bogy. Many believe it designates what is tantamount to a crime in public institutional management. Duplication, however, is of two kinds. One of them is perfectly harmless, justifiable, desirable, necessary. The other is exceedingly undesirable, first on the ground of expense and second on the ground of the animosities which it engenders.

"What is the extent of harmless necessary duplication? First of all the fundamental subjects, such as English, a limited amount of modern languages, physics, chemistry, biology, history and economics, and many more, must be taught in every institution of collegiate grade. The maintenance of a college without them is unthinkable, even if it is a strictly technical institution. These subjects form a sort of universal groundwork. Moreover, the allegation so often made that duplication is expensive and wasteful is probably untenable as applied to such subjects as have just been mentioned. Work in elementary mathematics, in chemistry, or in English composition may be just as economically carried on in two or three places as in one, if the instructors are paid at the same rate, the classes are of the same size, and each plant is full to the point of saturation. Similarly, laboratory space for several hundred elementary students in biology or physics may as well be provided in two places as in one. Duplication of this sort is not unlike that which prevails among all high schools. It constitutes neither an educational nor a fiscal problem for the State. The important thing is to keep clearly in mind the distinction between such duplication as this and the kind of duplication discussed in the next paragraph.

"In any but the most populous and most wealthy States the proposition that the State should establish out of hand two or more schools of law or medicine or dentistry would not be seriously considered. The demand for men trained in these professions would not warrant it and the expense, unless justified by the demand, would be an inexcusable extravagance. Probably no state would at present think of establishing two graduate schools to conduct costly research in the same departments for a few students each. In the same way it is doubtful whether any state not al-

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ready having two or more schools of engineering would seriously contemplate the establishment of more than one. Engineering education constantly becomes more expensive and involves constant additions to institutional equipment in the shape of costly applicances. Training in these and other professional lines is largely a thing by itself. It builds to some extent (in some lines more than in others) on the fundamental subjects mentioned in the preceding paragraph. It does not itself constitute, however, a component part of the training for some other pursuit. In other words, one may have to study chemistry and mathematics before one can study medicine, but one does not have to study medicine in order to study chemistry or law. If the [Bureau] were to make a sweeping generalization, it would say that duplication in professional lines (except teacher-training, for which few states provide sufficient opportunities) is highly undesirable."

The principle of differentiation in accordance with which it believes unwarranted duplication may be avoided, is presented by the bureau in the report on the state higher educational institutions of Iowa (Bulletin 1916, No. 19). It is stated as follows:

"In dealing with the problems of duplication as manifested in the practice of the Iowa state institutions, the commission [appointed by the Bureau of Education] has been guided by what may be described as the principle of 'major and service lines' of work. In accordance with this principle . . . each state institution should have assigned to it certain major fields which it may be expected to develop to their fullest extent. Agriculture at the State College of Agriculture and Mechanic Arts is such a major line. Latin, German, French, history, political science, psychology at the State University of Iowa are such major lines. Service lines are such subordinate subjects as are essential to the proper cultivation of a major line. The amount required is generally not very large. English is such a service line for engineering and agriculture at the State College. Institutions may well overlap as regards the relation of their service lines to one another and more particularly as regards the relation of their major to their service lines. English is a major line at the State University, a service line at the State College. But there should be no material overlapping of major lines.

In many parts of the educational field such a division affords a rational and practicable principle of administration. Between the State University and the State College this division would at present reserve as major lines to the institution at Ames, agriculture, veterinary medicine, home economics, and certain departments of engineering to be later determined. It would make all other subjects at Ames service subjects, in no case to be developed beyond the point at which the needs of the major subject are supplied. In the actual working of this principle it would result that a moderate amount of elementary collegiate work might be given at the State College in the languages and humanities and certain of the sciences, but that they would presumably never go beyond these rudimentary stages. At the State University, agriculture and certain fields of engineering, if cultivated at all, would in the same way have a place only as service subjects contributory to the major lines allotted to the institution.

"Certain subjects do not fall readily into line on such a principle of division. . . . Such cases of overlapping, however, provided the main principle is accepted, are all obviously capable of amicable settlement by means of a conference consisting of some convenient number of representatives of the faculties of the institutions affected.

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"Once this principle of major and service lines is adopted, the whole situation clears up, not only as regards intramural work but also as regards extension work. An institution would be permitted to do extension work only in a major line."

Undoubtedly the most critical question arising at present in connection with the distribution of functions of higher institutions in those States having separate Land-Grant Colleges and Universities relates to the disposition of the work in engineering. The separate Land-Grant College has claimed the development of all branches of engineering as its special right. The State University in those States supporting institutions of both types has generally made the same claim. Neither has been willing to concede the claims of the other. The resulting rivalry has led to intolerable mutual jealousies and antagonisms, to factional strife between alumni and faculty bodies, to waste of high-class men and equipment, to the infusion of politics into higher educational affairs. The problem involved is, therefore, perhaps the most vexed problem in higher educational administration in the United States. Is it capable of solution?

The bureau believes that with the aid of the principles just enunciated a solution may in each case be found. The bureau recognizes that the Land-Grant Colleges are under obligations to develop instruction in mechanic arts, and that the term mechanic arts has usually been interpreted as synonymous with engineering. It maintains, however, that the development of advanced work in engineering (senior college or graduate work) should be decided in the light of the needs of the State, the appropriateness of the location of each institution for such work, and the equipment of each. In other words, it is not an institutional question but a question of state policy. No institution should attempt to maintain a particular branch of training when it can be proved that greater benefit would accrue to the State if this branch were cultivated elsewhere.

In the effort to suggest settlements of the problem in different states in accordance with the principle of major and service lines, and having regard solely for the interests of the State, the Bureau of Education has offered four different types of recommendations on this subject.

In the report on the state higher educational institutions of Iowa the bureau proposed three possible methods of readjustment. One of these, being judged at present impracticable, will not be mentioned here. Of the other two recommendations suggested as alternative propositions, the first looks toward the consolidation of all engineering work at the Land-Grant College. It reads as follows:

"The [commission] suggests the union of the two schools in one place under highly expert direction. The commission is unanimously convinced that this is the method by which engineering work under state support in Iowa could best be maintained and developed. No other method will so certainly insure the permanent elimination of the causes of friction, irritation, unwholesome competition, and wasteful duplication . . . The commission is not unmindful of the weight of arguments which may be adduced in support of the unification of [engineering] work at the State University, where it would enjoy the stimulation of other high-grade professional schools, where it would have a strong backing in the pure sciences and helpful contact with the liberal arts, and where it could be maintained on a high level, free from the tug of artisanship. On the other hand, the commission does not forget the fact that the Land-Grant Colleges are quite

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as much bound by their essential character to develop mechanic arts on an equal footing with agriculture. In view of this necessity for the joint development of agriculture and engineering, the commission believes that such union of schools, if it could be accomplished, should be made at the Iowa State College."

The second recommendation shows the possibility of the avoidance of duplication in expensive engineering courses by the assignment of certain branches of engineering to the University and certain other branches to the Land-Grant College. I quote:

"If this method (discussed above) is adjudged impracticable of application, considering the present condition of institutional and popular sentiment in Iowa, the commission recommends that a definite vertical (or topical) division of engineering should be carefully worked out by the board of education in conference with a small group of expert engineers. wholly unconnected with either institution, each of whom should be a member of one or another of the four American societies of civil, electrical, mechanical, and mining engineering . . . In such a division it appears likely that the work in municipal and sanitary engineering, hydraulic engineering, and perhaps structional engineering, should be conducted at the State University, and that the work in highway, transportation, electrical and mechanical engineering should be developed at the State College."

In Washington a totally different local situation was found. The bureau, therefore, conceded the present desirability of continuing undergraduate work in the fundamental engineering branches at both the Land-Grant College and the University and of restricting the development of certain highly specialized lines to one or the other institution. The recommendations follow:

"The more the committee (appointed by the bureau to make the survey) has studied the question the more it has been impressed with the strength of the position of at least the fundamental branches of engineering in the curricula of both institutions. It is believed that while a college of agriculture and mechanic arts may be maintained with engineering on a lower basis than full professional courses, nevertheless, in Washington this seems to be exceedingly undesirable. Unquestionably also engineering has established itself as one of the vital departments at Pullman. On the other hand, the committee is equally convinced that the fundamental development of courses in engineering at the university represents the dynamic drive of a real demand, a demand which could not be met by an institution 400 miles away, a demand which, unless all signs and portents fail, will continue to increase.

"In view of these considerations the committee recommends that civil, mechanical, and electrical engineering be continued as major lines at both institutions. It is the more reconciled to this recommendation for two reasons: First, because the plants and engineering equipment of both institutions are now used almost, if not quite, to their full capacity. The concentration of both schools at a single point would entail considerable expense for new equipment. It is probable that, while it costs somewhat more to give the training in two places than in one, the added expense is, under these circumstances, not very great. Second, because the development of the State of Washington has already called, and will undoubtedly in the future call, for a larger percentage of trained engineers than are needed in most other states. The maintenance of two schools of engineer-

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ing (somewhat differentiated as is suggested below), while an unwarranted extravagance for a State like Iowa or North Dakota, may be justified in the State of Washington.

"Granting the justification of duplication of the three fundamental branches of engineering, the committee recommends certain limitations which will prevent the most sweeping future duplications, as follows:

1. Chemical engineering, already established at the University, should be restricted to that institution.

2. Graduate work in engineering branches, when developed, should be developed at the University and not at the State College.

3. The establishment of new lines of engineering at either institution should be authorized by the regents only after a joint conference of representatives of both faculties and both boards.

4. The committee is persuaded that only one school of mining engineering is needed in the State of Washington."

In another state, report on which has not yet been made public, still another set of local conditions led the bureau to make another type of recommendation, which is believed to be in harmony wtih the principles already laid down. These recommendations urge the concentration of all senior college and graduate work in engineering (except agricultural and industrial engineering) at the State University and the development of only junior college courses in engineering branches (exception being made of agricultural and industrial engineering again) at the Land-Grant College.

Perhaps it is too much to hope that the bureau's position in these matters should commend itself unqualifiedly to the members of this Association. It has, however, done its best to make a non-partisan contribution to the solution of this very critical administrative question. It has held constantly in view the fact that the service of the State is the touchstone by which every educational policy should be tested. It is convinced that its recommendation will, if adopted, be the means of saving some future expense in each of these States. But more especially does it believe that the application of the principles here set forth will effect a unity both of organization and of purpose in state systems of higher education that has not always characterized these systems thus far. In a matter so vital to the interests of numerous institutions in your body, however, it invites the frank criticism of this Association.

H. W. Tyler. A relation "altogether new" is said to have been brought about between the Bureau of Education and the individual Land-Grant Colleges; a relation not required by any existing law, open to question and discussion as a matter of educational policy and public interest. In determining the appropriate functions and relationships of permanent institutions, it is obviously most important to consider all phases. I am glad to note that the equivalence of land-grant and other institutions is recognized. This is in accord with our resolution that in every State the land-grant institution should do work of collegiate grade, both in agriculture and mechanic arts. To fall short of this would be unworthy of our status as a class.

It is said that the State has "at all times the right to redistribute the allotment, or to withdraw it if it chooses from any institutional beneficiary." I do not for a moment venture to question the legal correctness of this proposition. In view, however, of the importance of the continuity of

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policy in such matters, I should maintain that no state has a moral right to make such redistribution or withdrawal so long as the land-grant institution is carrying out the work entrusted to it with efficiency and economy. To do so would sometimes be contrary to its own true interests.

In attempting to deal with these problems, I am convinced that considerations of duplication and economy are too often exaggerated. I venture to maintain that our institutions of higher education as a class are so economically conducted that the burden of proof lies against any charge of wasteful duplication. Again, for the best development of any institution of education a high degree of freedom is immensely important. External control may conceivably be wiser in the abstract, yet less wise in the particular instance. This applies both to issues between the Federal Government and the several States, and to relations between state authorities and the institutions within state borders. I do not mean by this to imply any *laissez faire* alternative, but it seems to me a real and permanent remedy can rarely be accomplished by drastic measures or by outside intervention, or by emphasis on arbitrary educational boundaries, horizontal or vertical. It seems to me our best hope lies in an appeal to the patriotic cooperation, on equal terms, of the institutions in question. This course may be less speedy, but its gains should be durable.

Finally, I should wish to emphasize the time factor. We have here and there undoubtedly too many institutions, not in proportion to our area but in proportion to our present population and our present resources. Population and resources are, however, continually tending to overtake institutional supply. This will largely and increasingly justify such duplication as exists in work of collegiate grade. Such really costly and unjustifiable duplication as may exist in undergraduate work can be eliminated by the steady emphasis on institutional cooperation in the loyal public service we are all trying to render.

THE PRESIDENT. The formal discussion will be continued by Dean Marston of Iowa.

A. MARSTON. Dr. Capen's report contains much which is of such great interest and value to the representatives of the land-grant institution as obviously to deserve commendation and, hence, to require no particular discussion. A few of his statements of fact, however, and some of the recommendations which he describes cannot be accepted.

Dr. Capen states that the Bureau of Education has shown that the federal grants for agriculture and mechanic arts are of such nature that the State has, at all times, the right to redistribute the allotment or to withdraw it, if it chooses, from any institutional beneficiary. The only instances in which the point has been made an issue, so far as is known to the writer, were those in Connecticut and Rhode Island. In both of these cases, the State paid indemnity to the institution from which the grant was removed; namely, $135,000 to Yale and $40,000 to Brown University. It would seem that institutions may, by state action, acquire rights to the federal grants which amount in each case to a contract between the State and the institution, or between the State and citizens who donated land or money to found the institution, a contract which cannot legally be broken by the State alone, even though it be a fact that the national grant was made to the State and not to the institution.

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Dr. Capen states that the most critical question arising at present in connection with the redistribution of functions of higher institutions (in the States having separate Land-Grant Colleges and Universities) relates to the disposition of work in engineering. I feel sure, however, that the investigators cannot have overlooked the numerous, widespread and unmistakable signs of impending duplication in agriculture. In Illinois, for example, one of the state normal schools in reported to offer a quite extensive course in agriculture and to own a large farm as part of its agricultural equipment. In Iowa, the State Teachers' College already offers considerable instruction in agriculture, and even the University of Iowa has made a beginning in the same lines in its summer session. Moreover, the denominational colleges are developing agricultural departments. The movement towards very great extension of both collegiate and secondary agricultural education throughout the country in the near future is so widespread and so irresistible as to resemble some great process of nature.

It seems quite possible that duplication in agriculture may, at a not distant date, become much more important than duplication in engineering in the states mentioned by Doctor Capen. No educational surveys which neglect this subject in those states can be considered complete or adequate. Future generations may very probably come to speak of our present neglect of this subject in much the same terms used by Doctor Capen in condemning the duplication in engineering inaugurated fifty years ago.

Doctor Capen states that the Bureau of Education recognizes in the survey reports that Land-Grant Colleges are under obligations to develop instruction in mechanic arts and that "the term 'mechanic arts' has usually been interpreted as synonymous with 'engineering.'" This is not a correct statement of the interpretations in question. The term "mechanic arts" is much broader than the term "engineering." Mechanic arts includes engineering as one of its branches. Engineering is the professional or collegiate phase of mechanic arts. Sub-collegiate work, usually carried on by extension methods, is also included. The terms "mechanic arts" and "engineering" were carefully defined in 1914 as the result of an extensive investigation by a committee of the Land-Grant College Engineering Association, on which the Commissioner of Education himself served as a member*. The definitions recommended by the committee were adopted unanimously and were conclusively supported by many citations of authorities and practice. In this connection it may be well to quote from the 1915 presidential address of the Association of American Agricultural Colleges and Experiment Stations, the following paragraphs by President E. A. Bryan:

"Permit an aside here to deprecate the lack of a proper use of that great and inclusive phrase 'the mechanic arts' and the substitution, therefor, in common parlance and college curriculums, of the subordinate term, 'engineering.' The term 'engineering' by no means fills the concept of the 'mechanic arts,' and a broad field of future development in this direction lies even yet unexplored. There are the fine arts and the liberal arts; there are also agricultural arts and household arts; and there are the mechanic arts, which relate to all constructive work of whatever kind, and to the manipulation of all materials, whether of clay, or wood, or metal or what not. Most of us have judged all too narrowly in the use which we have

*Land-Grant College Engineering Association 3rd Proc. (1914), pp. 135-136.

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made of the fundamental laws and technique of the mechanic arts as they lend themselves to an educational program."

Doctor Capen states that the bureau's report on engineering instruction at Land-Grant Colleges and separate State Universties contain four different types of recommendations, as follows:*

"1—Recommendations looking toward the consolidation of all engineering work at the Land-Grant College."

"2—Recommendations showing the possibility of the avoidance of duplication in expensive engineering courses, by the assignment of certain branches of engineering to the University and certain other branches to the Land-Grant College."

"3—Recommendations admitting the present desirability of continuing undergraduate work in the fundamental engineering branches at both the Land-Grant College and the University, and restricting the development of certain highly specialized lines to one or the other institution."

"4—Recommendations urging the concentration of all senior college and graduate work in engineering (except agricultural engineering) at the State University, and the development of only junior college courses in engineering branches (exception being made of agricultural engineering again) at the Land-Grant College."

The writer is forced to say that he believes all recommendations of types 2, 3 and 4 to be fundamentally wrong.

First.—Any restriction of the land-grant college engineering work to less than the best and most complete, is entirely contrary to the letter and spirit of the Morrill Land-Grant Act. As to the letter of the law, the Act says "college," not "junior college." Both senior college and graduate work are proper functions of colleges and hence are required by the Land-Grant Act. As to the spirit of the law; Senator Morrill himself has written, in opposing attempts to restrict land-grant college instruction to less than the highest, that "Agriculture and the mechanic arts should be the foremost to be provided with the best instruction of all the ages," and again, that "It was hoped to be particularly valuable to the industrial classes, but it never intended to exclude education of the highest dignity."† Graduate work of one generation becomes undergraduate in the next. The Land-Grant Colleges must progress with the age. Engineering educators, the world over, are agreed that half-baked engineering education at any school is an educational crime. We trust our lives to engineers as well as to doctors. We should give the best engineering education possible or abolish the school.

Second.—All recommendations which, like those of types 2, 3 and 4, provide for teaching incomplete engineering work at one or both institutions, are fundamentally wrong, because they involve serious educational inefficiency. An engineering school is a costly manufacturing plant. The initial and annual cost of general engineering equipment and of the general engineering instruction common to all courses, and necessary for undergraduate or even junior college work, is high, as with any manufacturing plant, the cost of giving additional engineering instruction is relatively low. Hence, the fundamental principles of educational efficiency call for essentially complete engineering schools or none. The loss of educational

*The quotations are from Dr. Capen's advance abstract.

†See letters from Senator Justin S. Morrill written in 1890 and 1891, just after the passage of the second Morrill Act, Land-Grant College Engineering Association 2nd Proc. (1913), pp. 24-25.

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efficiency due to incomplete engineering schools is greater than that due to duplication. As Doctor Capen himself so justly points out, it is not duplication per se which is objectionable, but the greater cost of engineering education per student due to duplication, and the recommendations for incomplete engineering schools would perpetuate the high cost. Worse than that they would degrade the quality of at least a part of the educational work.

It is to be feared, in spite of Doctor Capen's position, that the employees of the bureau may have been influenced unconsciously by mistaken popular prejudice, and have fixed their attention too much upon doing away with duplication rather than upon educational efficiency and high quality of educational work, which are the true governing considerations.

Since we should educate good engineers or none, and since the Land-Grant Act requires that engineering be held on a par with agriculture, only two types of recommendations as to engineering instruction in the case of the Land-Grant Colleges and separate State Universities can be justified as fundamentally correct.

1. Consolidate all engineering work at the Land-Grant Colleges.

2. Maintain essentially complete and well equipped under-graduate and graduate collegiate engineering schools at both institutions.

The latter may be advisable in some states, owing to large population, special industrial needs, geographical conditions or the lack of private engineering schools, but incomplete engineering schools and low grade engineering instruction are crimes against educational efficiency and educational morality and can never be justified.

THE CHAIRMAN. Dean E. F. Coddington of Ohio will close the formal discussion.

E. F. CODDINGTON. Is was easy to predict that the storm center of this discussion would lie in the vicinity of the separate land-grant institutions. I do not represent this type and cannot intelligently or with propriety enter upon this phase of its discussion. I may properly consider one point made by Dr. Capen, namely: the efficiency or lack of efficiency in institutions, due to organization.

The bureau is endeavoring to assist the separate Land-Grant Colleges to adjust themselves to the educational policies and conditions of their respective States, in order that they may work in harmony with their sister institutions, the State Universities; a valuable service and deserving of high commendation. It can render another service to the Land-Grant Colleges that are connected with the State Universities, which I will attempt to define. The State Universities have developed along the lines of and with the same ideals as the traditional colleges of arts and sciences. In such institutions practical studies are largely excluded, the desire often being to extend the boundaries of human knowledge, irrespective of whether or not the information thus acquired will be of service to humanity. It cannot be denied but that these boundaries will extended further in such an institution than in one where only useful information is sought; but it must also be admitted that much of this knowledge has little or no practical value.

Now this would not be objectionable if it did not lead to certain other tendencies. In such an institution each instructor not only endeavors to add his mite to this increase in his chosen field, but also tries to prepare his students and instil into their mind the desire to continue work in this same field. Professors of mathematics attempt to make mathematicians,

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and professors of physics, physicists. The hoi polloi are weeded out of its elementary mathematics classes and the more promising students encouraged to take advanced courses. A professor of mathematics who is also a departmental head and dean of his college rejoices that he is no longer connected with an engineering institution, because engineering students learn no mathematics. I believe his opinion is not well founded. However, even if his opinion is not justified, surely he could not have been an efficient instructor for engineering students. If the facts were known, perhaps he left the engineering institution because he had these ideas as to the mathematical field, and the question arises, how many such instructors in mathematics may there be left in engineering institutions? That there are others is quite evident. I recently asked an instructor in mathematics this question: "Do you professors endeavor to make mathematicians of your engineering students or do you recognize that that is impossible, with at least 90 percent of them, and therefore do what you can to teach them practical mathematics?" He stated that one-third of the instructors did recognize the impossibility of producing mathematicians, and were endeavoring so to adapt their teaching that engineering students might get a working knowledge of algebra, trigonometry, analytical geometry, and especially of calculus, and that the other two-thirds were still endeavoring to produce mathematicians, and that their students failed to get any working conception of calculus.

If these tendencies are to be found in separate Land-Grant Colleges, where applied rather than pure mathematics are inferentially at least the goal, what may we expect to find in the Land-Grant Colleges that are connected with the State Universities where the ambition of most of the instructors in mathematics is to become eminent in some branch of pure mathematics? Professor C. R. Mann, of the Society for the Promotion of Engineering Education, states (Ames meeting, page 77) that of 200 students graduated at 10 institutions of state university grade, 52 percent barely passed in physics; 45 percent in mechanics; 51 percent in foreign languages; 35 percent in calculus; 35 percent in English; 22 percent in chemistry. It would appear that the chemists are doing better work with their students than the mathematicians. That statement certainly establishes inefficiency.

If the Bureau of Education has been able to ascertain that its following statement is true, namely: that "first of all it has emphasized the complete educational equivalence of the work done in the collegiate department of the Land-Grant College to that done in the State University," then it can certainly obtain evidence to show whether or not the fundamental sciences are efficiently taught to engineering students. This is one of the difficulties with which we have to content. It is a hard problem to solve. Perhaps an outside agency could help us. Some institutions complain that they cannot get mathematics or physics taught in the arts department, and have established separate departments. Perhaps this is the best solution of the problem. I am not convinced that it is. My object in this statement is to show that there is an opportunity for the separate Land-Grant Colleges to take hold of this problem, and without difficulty to handle it; whereas in some of the combined institutions the proposition is much more difficult. There the department is autonomous, and if such a department is not doing good work, and we cannot convince it of this fact, we are

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helpless; but if we could get help from the Bureau of Education, it would be of great benefit.

H. J. Waters. I appreciate the delicacy of the task which the Bureau of Education entered upon when it accepted the invitation of the authority of some of the States to give definite and detailed advice regarding the adjustment of differences between the state educational institutions. The large and important official relation which the bureau sustains to our state institutions makes the undertaking of which I have just spoken all the more delicate and difficult.

Frankly, it is my judgment that the Federal Bureau of Education cannot go further than to lay down general principles and let the people of each state undertake the task of applying these principles in the adjustment of the differences existing among their educational institutions. For the bureau or any other outside agency to undertake to adjust these differences without an intimate knowledge of the local traditions and local needs, is certain to result unfortunately.

I was much interested in Dr. Capen's paper. He has aided me in my thinking regarding some of the phases of the general situation. I was particularly pleased to have the Bureau of Education recognize that the work done in the Land-Grant Colleges is equivalent to that done in the State Universities in the major and important lines. The latter named institutions have been slow to recognize this fact.

I welcome the suggestion to divide the field of these rival institutions into major and minor lines. It cannot fail greatly to simplify the problem of differentiating between these institutions, once we agree on what are the major lines for each and which are the minor activities. I maintain that under a reasonable construction of the Morrill Act and according to to the traditions of the Land-Grant Colleges, agriculture, mechanic arts, and household arts are major lines for that group of institutions. All other subjects must be regarded as of minor importance. The Land-Grant College has no reasonable ground for objection to the State maintaining other institutions in which these subjects are taught, but it can reasonably object to any of these lines being developed as major lines at any other state institution. Within the needs and the means of the State there should be no limit imposed to the development of work in these three major lines at the State College.

I do not know whether those who made the survey to which Dr. Capen referred in which it was recommended that engineering be split horizontally and only the first two years of the work in this line be given at the Land-Grant College, while work extending over the full college course be given at the State University, realized fully the effect of putting such a suggestion into effect. The effect would be completely to destroy professional engineering at the Agricultural College and to transfer all of this work to the University. It were far better to meet the issue squarely, by advising the transfer of the engineering division, root and branch, to the State University than to accept the principle that one of the major lines at the Land-Grant College may be reduced to the rank of a minor. Such a recommendation is in effect a contradiction of the principle laid down in the first part of Dr. Capen's paper that the two classes of institutions are equal in their major lines and would give the State University the authority of the

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Federal Bureau of Education for claiming superiority in rank. I hope sincerely that the report may be modified before it is promulgated.

I regret also to learn from Dr. Capen's paper that it is proposed by the board of education to restrict graduate work in engineering in the State of Washington to the University. The effect of this suggestion, if accepted, would be to weaken the undergraduate work in engineering at the Washington State College. If we do only undergraduate work in the Land-Grant Colleges, it is sure to be weak undergraduate work. This is true of agriculture and home economics as well as of engineering.

It is of fundamental importance that the Land-Grant Colleges be left free to develop along their major lines without restriction, vertically as well as horizontally. The minor lines in these institutions should receive only such encouragement and development as is necessary to give these students a sound education in agriculture, engineering, and home economics. Beyond this point the Land-Grant College has no right to attempt to develop its work, but in this field there should be no restrictions imposed.

HOWARD EDWARDS. The Land-Grant College originated not with the State but with the Federal Government, from which the State accepted certain proposals. Those proposals carried with them certain obligations on the part of the State. Now, in consideration of this subject so far, emphasis has been laid not on the obligation of the State toward the Federal Government, but on local conditions within the State. I maintain that these Land-Grant Colleges are not separate, disassociated, independent, unconnected, uncorrelated institutions. The welfare, the general prosperity, and certainly the character of each individual institution is a matter of concern to the full, combined, organized body of Land-Grant Colleges. The State, when it accepted the proposals of the Federal Government in regard to these schools, also accepted a duty to the idea itself, towards the development of what we may call college education directed towards industrial pursuits. Now it makes no difference whether the Land-Grant College is united with another institution and made a State University on the land-grant basis in part, or whether it is established as a separate Land-Grant College, the obligation is the same, and that obligation is to allow a just development vertically on the land-grant foundation. The institutions created were colleges. Collegiate rank is even emphasized in the Morrill Act of 1890 by the implications created in the statement that in the several states where the division of the funds was possible desired, "institutions"—the word "college" is not used in that connection—for colored students might be created and the funds might be divided; but in the general course of the acts under which the States accepted the grants from the Federal Government, the word "college" with all its implications, is consistently used. Now, if a procedure is adopted in any state which virtually lowers the activities, the dignity and the standing of the Land-Grand College of that State, implications are created which extend over the whole series of land-grant institutions throughout the United States. It may be that institutions in some stronger states, like Iowa, for instance, can withstand such implications; but those of the smaller states might not be able to resist the influences thus brought to bear.

While, therefore, the Bureau of Education in its ex-cathedra recommendations as the result of its surveys, seems to be considering merely

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a local situation, it really is unfavorably affecting the standing of a great educational organization throughout the entire country.

W. M. Riggs. This question of educational surveys is perhaps even more pertinent to conditions in the South than to conditions elsewhere, because in almost every Southern State there exists a Land-Grant College and a separate State University.

The principle objection to this form of investigation is, in the opinion generally held, I believe, by the Land-Grant Colleges, that the Bureau of Education is not as well equipped to evaluate their work as it is that of the State Universities.

Of course I assume that the bureau brings to its aid experts in technical and industrial education; and yet, beginning with a most unfortunate publication of some years ago which sought to classify the colleges and universities of the country—a publication promptly withdrawn from circulation and in a sense apologized for—the bureau has never shown quite the sympathy for the Land-Grant Colleges that it has manifested towards the strictly classical institutions.

Unfortunately, too, these investigational surveys have usually been an outcome of a controversy between institutions in the State "surveyed." While I am sure the bureau has never entered a state without an invitation, yet too often there was the suspicion that the request or legal authority was inspired by one party to the controversy.

If a survey is to be made, both the parties at interest should have a voice in selecting the jurymen who are to sit on the case. From opinions freely expressed in some of the States surveyed, it would seem that the investigators have not been regarded as altogether competent in the sense that they were not equally familiar with the purposes and methods of the several institutions coming within the scope of their investigations.

Dr. Capen's paper is certainly a classic in expression, and contains some fine truths and very clear generalizations of principles we have all vaguely held. I trust that its value in clarifying issues and in generalizing certain important fundamental principles will not be obscured by specific recommendations that can only pour oil on the fires of controversy already raging in some of the States which have been surveyed.

E. O. Holland. During my educational experience I have been connected with both a separate university and a separate land-grant institution. I have seen both sides. I have come into direct vital touch in the State of Washington with some of the difficulties that attend a so-called educational survey. I believe from what I have seen in Indiana, that, while the charge of duplication in many respects is false and futile, much saving may be made by eliminating certain kinds of duplication.

In a large state like Washington, 450 miles square, its population divided into two large districts, certain exceptional difficulties must be considered and overcome. Doubtless both institutions have erred in bygone years in the formulation of their curricula, in failing to recognize their proper major line developments.

I heartily endorse President Waters' point of view that we in the land-grant institutions should prosecute our work along the large lines, as far as it is possible to do so. Junior college work will not prove satisfactory. If any reorganization is brought about in Washington it should be along

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the lines of restriction within major subject lines. Economy and efficiency cannot otherwise be obtained.

We feel in Washington that it is unfortunate that engineering instruction is recommended by the experts to be curtailed at the State College while no such restrictions are set for the State University; that as much latitude is given to the University as is given to us in home economics. The only major field left to us is agriculture, and even here attempts to duplicate our work have been made.

I believe that had a little more care been given to the survey recently conducted by the United States Bureau of Education, some of the conclusions reached would have been modified. Six or seven weeks is entirely too short a time for a group of experts to devote to a great state when they must consider both present conditions and future developments. Dr. Capen had a very difficult and in some respects an impossible task to do in this brief time.

THE PRESIDENT. I will ask Doctor Capen to close the discussion.

S. P. CAPEN. I regret that Doctor Claxton is not able to make this final statement, not only on account of his health but because there are some general ideas that he has in respect to this matter that I wish might be expressed today to your body.

On certain points that the discussion has brought out, however, we ought for own sake to make our position clear. I seem to have sensed the implication that the Bureau of Education has been intruding upon the States in the guise of an investigator, and that the propriety of its action in so doing is questioned. I want to make it perfectly plain that the Bureau of Education has never of its own initiative attempted to make any sort of investigation in any state. We have been urged, with an insistency of which perhaps you gentlemen are not aware, to assist 15 or 20 States in making educational surveys of one kind or another. Perhaps this is because educational surveys are now the fashion. At any rate, many people believe that they want them very badly and that the Bureau of Education is peculiarly qualified to render this service, since it has no direct connection with local administrative agencies. I think they are entirely right in this view. The Bureau of Education is peculiarly qualified, both by reason of its aloofness from partisanship and by reason of its knowledge of educational conditions in all parts of the country, to have a hand, at least, in educational surveys.

Our position has been that of a judge before whom a case is tried. It will probably be admitted by those who have spoken this afternoon that there is a very serious controversy in all the States into which we have entered as university surveyors. As we see it from the outside, it is more serious than you gentlemen believe. It is a condition highly deleterious to educational progress in the United States that there should be so much animosity as commonly exists between the two types of institutions concerned. A tremendous amount of evidence is submitted to every survey committee bearing on both sides of the controversy. We are expected to pass on this evidence. We may not be experts in the particular line under discussion, but we are supposed to have general knowledge of the field and to be non-partisan; and we are asked to give an opinion. In effect, as I have said, the case is tried before us as judges. In nearly every survey, also, we have associated with ourselves persons outside of the bureau

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staff. Generally there have been more outsiders—acceptable in each case to the state officials who have asked for the survey—than representatives of the bureau itself. Thus our judgment has been diluted or reinforced, according to the exigencies of the situation, by that of persons actively engaged in the work of educational administration.

In the beginning the Bureau did not plan to publish the results of surveys. The report of the first university survey, that of the University of Oregon, was published by the institution concerned. Later on it appeared, however, that a survey is in the nature of a study of current educational conditions. It has more than local interest. It is similar to the studies we are publishing all the time. For the information of the country, therefore, these documents ought to be circulated. We ought to be put on record, also, and made to be consistent as far as possible. For these reasons the commissioner has ruled that all other educational surveys made by the bureau should be published by the bureau and circulated as widely as possible.

We do not claim to be divinely inspired, nor do we wish to assume a papal attitude towards education, and certainly not towards the Land-Grant Colleges. All that we have attempted to do is to be of assistance in what the States themselves have regarded as an emergency. It may be that we were wrong in yielding to state demands. I am not yet convinced, even by this discussion, that we were. I think this is precisely the kind of service that we ought to render, and if it meets with criticism and opposition we ought to take these as part of our general responsibility as public servants. If you can prove to us that we have been entirely mistaken in the principles we have proposed, undoubtedly we shall change both principles and application. It seems to me that every survey stands on its own bottom as a piece of work primarily of a scientific nature, done by the scientific method and in the scientific spirit. We put it forward as something which the facts themselves justify. If they do not justify it, it is of itself condemned.

I have not prepared this rebuttal beforehand and it is rather random. My principal point, however, is that we have attempted nothing at all in the way of control or direction of the Land-Grant Colleges as such. We have simply served as judges, or as surgeons if you choose, in cases of state difficulties.

I should like to mention one or two other questions raised in the discussion. Dean Marston questioned the correctness of the assertion that a state has a right to re-distribute the allotment of government money to educational institutions, or to discontinue its support of any particular institution. The bureau has the legal decisions on that point. I presume you do not wish to be bored by a full reading of them. As a matter of fact the decisions in the Connecticut and Rhode Island cases, which were mentioned, confirm my assertion. This right is even more vigorously stated in several other court decisions, notably in the cases of Wyoming and Florida. I think there is no doubt in regard to this point, which I do not regard as particularly important. I allude to it now merely that the argument may be complete and that you may understand the basis on which the statement was made.

I am not certain that President Waters may not be right fundamentally in his proposition that it is the place of the bureau to enunciate general principles and not to make specific application of them. However, you cannot enunciate general principles that are worth the paper they are

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written on without a minute study of local conditions. The principles laid down in all our survey work have arisen out of a study of local conditions such as the bureau was never before in a position to make, such as we never could make from our office. I am inclined to think that just exactly the type of detailed study which we have undertaken, faulty though it is, as I know—I accept President Holland's criticism that we have often been forced to work too hastily—will be of assistance to the educators of the country.

If you do not like our solution of a particular problem, you do not need to adopt it; and if you can convince us that we are wrong, we will never suggest that solution again. But the facts on which the conclusions are based are after all the most important result of a survey. These, if they can be documented, must be acknowledged, however painful they may be.

I am grateful for the opportunity of presenting this matter to you. I hope I have succeeded in setting forth the spirit in which we have undertaken this work. It is not a task which one would engage in for any purpose except to be of service. Quite the most disagreeable job in the world is to attempt to make an educational survey. One is certainly not persona grata while it is being made, and one meets very few state officials with whom any measure of popularity whatsoever is afterwards preserved.

On motion, the division adjourned.

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SECTION ON EXPERIMENT STATION WORK

Afternoon Session, Wednesday, November 15, 1916

The station section was called to order at 3 p. m., by the chairman, B. W. Kilgore of North Carolina.

The Chairman. Director R. L. Watts of Pennsylvania will discuss the "Shaping Results of Experiment Station Work for Extension Uses."

Shaping Results of Research Work for Extension Uses

By R. L. Watts

The achievements of agricultural extension depend mainly upon four factors: (1) adequate financial support; (2) properly trained specialists; (3) information of vital importance on production and marketing; (4) the effective presentation of data relating to farm practices.

It is generally conceded that extension workers as well as farmers must depend almost entirely upon the agricultural experiment stations and the United States Department of Agriculture for new and important lessons. Our whole extension service is built on the foundation of results obtained by the various research institutions. Never before have these institutions had such opportunities and such effective machinery to utilize "to cash in," data of real value. In this connection, should we not bear in mind that facts rarely speak for themselves? Somebody must speak for them. The results and the value of their application may be perfectly clear to the investigator himself, and perhaps to other well-trained scientists, but unless they are reshaped, translated, clarified and popularized they will not be heeded by the millions of people who help defray the expenses of the investigations and for the benefit of whom investigations are conducted.

It is exceedingly gratifying to conduct an experiment and to arrive at satisfactory conclusions; but as an economic proposition, its completion merely marks the beginning of the project. The experiment may be practically useless unless special and perhaps unusual efforts are made to convey the results to the fields and barns where they can be applied.

At this point, it seems desirable to raise the question, "who should be the translator of experimental data?" Is this the business of the teacher or of the extension specialist, or should the experimenter himself determine and execute the plan which is to be used? There are arguments in favor of the employment of specialists for this task who may be connected with either the extension service or the experiment station. Such men should know the relative merits of different methods of presentation—bulletins, charts, graphs, photographs, tables and curves. They should also be experts in the technic of making and presenting graphic illustrations. The services of such an expert in each institution would be of inestimable value. But we must not lose sight of the fact that the experimenter should know the results better than anyone else, and that he, too, is most anxious to have the results benefit the people for whom the experiment was made. It is important, then, for him to study methods of presentation, and to translate his data into the most effective form, which perhaps can be improved on by the special translator.

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Most of the institutions now publish technical bulletins or papers which are not intended primarily for extension uses. In the preparation of all other material, whatever its form, we should constantly bear in mind that it is intended for farmers and that most farmers have not had technical training. The number of college men engaged in practical agricultural pursuits is rapidly increasing, but the proportion of such men to the total population of farmers will remain small for many years. This makes it imperative to shape research results in such a manner that they will be readily understood by the farmer whose education perhaps has not extended beyond the grade school of the rural district. This does not mean that the bulletin or chart should be stripped of the simpler, well-known and commonly used terms, as nitrogen, protein, etc., but that technical terms and expressions should be eliminated as far as possible.

The farmer is a business man. He earns a living by producing and selling farm products. He thinks in terms of dollars and cents and advantage of this fact should be taken whenever possible in the presentation of experimental data for his consideration. The dollar method appeals to him and is most likely to hold his attention. The farmer, too, is a busy man. He seldom has time to study massive material.

Although material is prepared primarily for the farmer, extension specialists and county extension representatives can use the same material. In the majority of instances, presentations which are satisfactory for the farmer will also meet the needs of extension workers.

The working plan, whatever it may be, should conform to a few fundamental principles, which may be enumerated as follows:

1. The eye is more receptive of knowledge than the ear. We remember what we see better than what we hear. Every school teacher realizes this fact. In recognition of this principle, photographs, graphs, maps and curves are important means of presenting results.

2. Simplicity is an essential element. A simple presentation, whatever the form, is always the most forceful.

3. Brevity counts for effectiveness. The value of a bulletin or chart does not depend upon a large amount of material crowded into it. It is better to present a few facts in a striking manner rather than many without prominence given to any of them.

4. Clarity is absolutely essential. This may require the use of graphic illustrations and explanations which may seem longer than necessary to the investigator who made the experiment and who understands the minute details of the project and its results.

5. A popular style of presentation is necessary. Photographs are particularly valuable and the language itself should be of a style which will be pleasing to the reader.

The bulletin and circular method of presentation is popular with the investigator. After conducting an experiment for months or perhaps years, he is anxious to report results. He has been deeply absorbed in the investigation. He believes that the results are of great importance to the State and perhaps to the Nation, and he is certain that a comprehensive report should be prepared. A great mass of data—figures, descriptions and explanations—all apparently important are before him. He begins to write. Page after page is produced, and, finally, after covering a ream of paper, more or less, the manuscript is completed, and, with a sigh of relief and satisfaction, he submits the paper to the director of the experiment

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station. It may or may not be reduced in volume before being sent to the printer. In too many instances, we fear, graphic presentation, simplicity, brevity, clarity and style receive very little consideration. If an investigator has discussed a truth that is worth while, it should be presented in a convincing manner. The author should have a conference with the station director and the editor about the size of the bulletin and methods of presentation before he begins to write. There seems to be an agreement of opinion among station workers that most bulletins are too long. It is not an easy matter, however, to convince the author that, generally speaking, a 16-page bulletin is more effective than one double that size. The old saying that few souls are saved after the first 30 minutes of a sermon probably applies equally well to preaching the gospel of good farming by bulletins that contain more than 30 pages, unless they are for reference purposes only.

Tables in bulletins and on charts are indispensable. They make it possible to present a mass of data in the most condensed form. But tables are not attractive. Farmers seldom have the interest or the patience to sift information from them, especially if they are massive. Extension workers are too busy to spend the time necessary to pick the kernels from a great array of statistics. This work should be done for them as well as for the farmers. Massive tables are necessary in keeping records, but they should not be used in bulletins, nor on lantern slides or charts, unless there are special reasons for doing so. Condensed tables may be effective.

Photographs, if good and appropriate, are always effective. They attract attention and present results in a striking manner. It is not always necessary to use full page or even half-page illustrations. A large number of small pictures may be better than a few large ones, but they must be first class. Many a good bulletin is spoiled by poor illustrations.

Charts of various descriptions are generally employed. Those with photographs (which may be colored), formulas and short sentences are highly effective. There is a large field for the use of skilfully designed charts.

Graphs are exceedingly useful in the preparation of bulletins, circulars, charts and lantern illustrations. They appeal to the vision and present facts in a striking manner and in their true proportion. A properly designed chart is easily analyzed, perhaps without any mental effort, and the interpretation may be almost instantaneous. By an examination of a large number of bulletins and circulars, we are convinced that graphs of various forms, especially horizontal bars, squares and circles, are not employed as generally as they should be. Colors may be used to great advantage in the making of graphs.

Maps can be employed in presenting results of economic importance to certain counties and districts. When the results can be expressed in terms of dollars and cents, as applied to different areas, maps will prove especially valuable.

Curves are used to a large extent in bulletins and on charts. Some of them serve their purpose very well, while others must seem complicated to the average farmer. The curve, although easily read and understood, has a technical appearance. However, it facilitates the charting of a mass of material in a remarkably short time. In many instances the curve is superior to tables as a method of presentation, and not infrequently it is

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better than horizontal bars and other forms of graphs. It also permits of finer interpretation than any other method.

E. A. BURNETT of Nebraska. Posters have been used with success in many instances in presenting experimental data for extension purposes. For example, potato posters showing the effects of scab, dry rot, and other diseases, with suggested treatment, are more effective than detailed descriptions of the experiments themselves.

Many authors seem unwilling to present a summary of their work giving practical instructions to the farmer, but feel that they must discuss methods in detail for the benefit of scientific workers even though the bulletin is designed for popular use. For example, a 200-page bulletin from Nebraska shows in detail the methods by which much experimental work was done, the data being tabulated in technical form. This bulletin is suitable for the use of technical experimenters for whom it is intended, but entirely unsuitable for popular use. It represents an extensive piece of research work which probably will enhance the reputation of the author among men interested in his subject. Where a bulletin of this nature is published, some person acquainted with the practical application of the experiment should take the results and place them in graphic form for popular use. We try in our popular bulletins—in fact, in all of our publications other than research bulletins—to draw conclusions when warranted, placing them on the front pages preceding the general discussion. We formerly were opposed to placing the results before the discussion of the methods, but now feel that this is warranted, since farmers do not care for a discussion of methods as much as for concrete results and the manner in which they can be adapted to their uses.

Some of our bulletins are only four pages long. Where a publication of this length can be used to convey practical instruction, it is more useful to the farmer than a longer one. While it is difficult to establish an arbitrary limit as to length, all popular bulletins should be brief, clear and free from intricate details. We believe that no extension bulletin should exceed 16 pages in length.

In the presentation of extensive investigations, it is advisable to publish limited editions for the use of other station workers. Comprehensive publications are justified in order that the field covered and the methods used by an investigator may be clearly shown, obviating the necessity of other investigators covering the same field. Such bulletins should be printed in limited editions for the use of station workers only. Where extensive bulletins are published covering methods, popular editions should also be published for the use of the general public if the practical results warrant it. These should rarely exceed 16 to 20 pages in length.

In organizing experimental projects, consideration should be given to those practical problems which are pressing for immediate answer. Such investigations can generally be completed and reported upon with a reasonable time. Other more technical projects must be continued for many years. In this case, reports of progress should be made from time to time and, when the project is completed, a final report should be made for the use of station workers. This report may of necessity be long and technical. It should not be sent to farmers or to the general public, but only to those interested in technical investigation.

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Graphic methods should be used to present practical lines of experimental work. Bulletins should be timely and, if the material is at hand, should be frequent enough to retain public interest in the work of the station. Sometimes our best investigators withhold publication until the people have lost interest in the results. They repeat experimental work in an effort to eliminate all possible error, and, when the results are published they find that others have anticipated their results to an extent which frequently makes them devoid of public interest.

When experimental projects are under consideration, a sufficient number having a strictly economic bearing should be carried so that popular interest will be maintained in the work of the station. This relieves it of public criticism for expending large sums of money on very technical lines of work which have little economic interest.

B. Youngblood of Texas. We look upon the extension service as an effective means of getting station work directly before the people; and we look upon the station as the fountain head of correct information. If, however, station workers remain in their laboratories and on their farms and do not see to it that their work is understood and appreciated by the people, the extension service may so overshadow the station that it cannot secure adequate appropriations.

The extension service finds problems for the station. A considerable number have been discovered by our extension men within the past two years, problems in which our station men have been interested but to which they had paid little attention because of lack of funds.

The Texas station issues three types of publication, namely, technical bulletins, popular bulletins and circulars. The extension service bulletins now in a measure replace the circulars. We realize that a clear and graphic and effective presentation of a subject is essential, whether the publication is technical or popular in character, and we realize that we must appeal to our constituents not only for their sakes but for our own sakes, lest we become so little known that popular interest in us wanes and our opportunities become curtailed.

Promptness of publication is also important. Some station workers tend to keep going along with their work and seem as afraid of printer's ink as the devil is said to be of holy water. How can a station director handle such cases?

F. S. Harris of Utah. Experiment station workers should be somewhat careful not to over-popularize their work. Their chief function is the discovery of truth. The results of experiments should be presented in a graphic manner in order that they may be easily interpreted; but it seems to me that in the past station work has lost prestige among scientific men largely because of the hybrid nature of the publications, in which attempts are made to combine reports of technical experimental work and popular teaching of well-known facts in one issue, so intermingled that neither has been properly presented.

The primary function of the station worker is to collect and present data that are in whole or in part scientific. If that is done we need not worry about the work getting out to the farmers. We now have a good means of accomplishing this through the extension service. Our responsibility as station workers is to see to it that our data are presented clearly,

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concisely and accurately so they will have a standing among scientific workers. Let us not sacrifice accuracy to diction.

C. P. GILLETTE of Colorado. It sometimes happens that extension men do not correctly set forth the results that have been reached in station investigations. For example, I am certain that technical information contained in some of our bulletins has not been thoroughly understood by the extension men and that, as a consequence, their ability as carriers of this information has been limited. Station and extension men should get together to the end that the latter shall properly and fully understand station results. Some sort of school should be held in order that extension men may not teach heresies. If this cannot be brought about, then, in self-defense and in the interest of truth, the investigator should be the interpreter of his own work.

F. B. LINFIELD of Montana. We consider that the extension specialist is a member of a department. We expect him to prepare all its informational circulars. The printed matter should not, however, be solely his own product but should represent its best thought and experience. Consequently whatever he prepares is passed upon, criticised, modified and unified and, in its final form, expresses the point of view of the department and not that of any one man. This practice may also be a large factor in his training. Extension workers are gathered from all over the country and often are unfamiliar with local problems or local methods. The preparation of printed matter which must pass the scrutiny of departmental heads would be of much help in enabling the extension worker to get the right point of view. It will also make for consistency of teaching throughout the institution.

E. W. ALLEN, Washington, D. C. May I refer to a plan which is being worked out at several of the institutions, namely, the connection of extension specialists with various departments? These specialists are located in the departments representing their subject matter, and are thus brought into direct contact with the work which the experiment station investigators are carrying on. They are in a strategic position to make use of that work, in the preparation of popular publications which summarize the results in a particular field, in meetings of county agents where instruction is given, and in answering the large number of inquiries that come by correspondence. We recognize that there are limitations to what an experiment station man can do. In many stations the inauguration of the extension service has relieved from much routine and expository work the men on whom reliance must be placed to furnish the accurate information which is to be extended.

On the other hand, I feel that the station worker is entitled to present his results to the public in a way which will appeal and be understood, and will retain the public interest in his work. Therefore I favor the popular presentation in station publications of non-technical station work, phrased in a concise manner, with clearcut, brief conclusions. It is sometimes worth while to present the results of investigation in more than one form, i. e., in their popular or practical aspects on the one hand and in technical detail on the other. Large amounts of data are accumulated in the course of investigation which are of very special interest to men working in similar lines and valuable in the advancement of science; and these

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should be recorded. But the regular bulletin series does not seem the place for this matter. There are ample and suitable channels through which such material can be published, the practical outcome being issued in a more popular and concise form.

E. A. BURNETT of Nebraska. Do I understand Doctor Allen to advocate the publication of the popularized results of station work in the form of station bulletins? Some of us seem to feel that such publications should be issued as extension bulletins, but more station directors, I am sure, feel that the popularized results of station work should be published as station bulletins.

E. W. ALLEN. That is my idea exactly. I think there is danger in cutting off the investigators entirely from contact with the farming public. If the stations are to publish only technical bulletins and large publications which are not suited to the general reader, they are in danger of losing their hold on the people. Station workers ought to be better able than outsiders to digest the work which they have done, and to state the results in the terms of the practical man.

It is now being suggested that when a station is issuing a bulletin suited in substance and style to the needs of extension workers, the extension department or division should order a sufficient edition to satisfy its requirements at the time the bulletin goes to press. For, manifestly, the experiment stations can not issue their bulletins in sufficient edition to give the wider distribution that is often needed in extension work. I am not referring, of course, to popular summaries but to popular accounts of work which the issuing station has itself accomplished. As a general rule, I do not favor the reporting of the station work in its original form in the extension series, even though the work and results are primarily of popular practical interest. The station is entitled to publish its work under its own name and in its own series.

W. M. JARDINE of Kansas. Since the extension idea has grown so greatly in Kansas and since the station workers have had so little opportunity to get out among the people with their information, the station seems to be fighting a losing game. It seems likely that our appropriations will be decreased because our people lack familiarity with our work. Practically all station information of late has been carried to the farmers by extension workers. Extension workers are human beings and naturally stress the importance of their own jobs. I have found it necessary to make special effort to keep the experiment station before the people in order that we may get our share of the appropriations and keep abreast, or, as we should, in advance, of the extension workers. Special lectures with lantern slides showing the most important lines of work under way at the station and results obtained of unusual practical value, were prepared to give before the farmers that they might perceive the real situation; that they may know that we have an experiment station and that it constitutes a very vital part of an agricultural college; that they may come to perceive that if it is not properly supported, all other work in the improvement of agriculture must sooner or later become more or less superficial. Wherever I have had an opportunity of presenting this point of view to an audience, interest has been aroused and more information has been requested.

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Generally speaking, there are no better men to carry facts to the farmers than those who dig them out. When our station workers appear before audiences of farmers they almost invariably make a favorable impression, because they present material obtained from their own investigation and experience. I do not disparage the extension workers, but the fact that they are not connected directly with the digging out of the facts makes them less sure of their ground. We require our investigators to get out among the farmers occasionally, to become acquainted with them, to learn their problems, to mingle with the county agents, and so maintain close connections with actual farm conditions.

A few years ago our extension workers were not even located in our department of agriculture. Now our extension specialists are in the same office with station men in their special lines, and we rotate and alternate as much as possible in order that everyone may be enabled to familiarize himself with what is going on alike in station and in extension lines. While we may not be accomplishing as much as is desirable in the way of popularizing the results of station research, we feel that distinct advance is being made yearly. The fact that our constituency is constantly growing is evidence of our success.

W. L. Carlyle of Oklahoma. As time goes on and extension work grows, the number of county agents and extension men will increase. We have in Oklahoma 65 county agents as well as many specialists. We have adopted the plan of bringing all these county agents to the station and college twice a year, once in the winter for a week or ten days, when they are in consultation with our station and research men in the laboratories, and once in the summer when they spend most of the time they are with us in the experiment plots and with the stock.

The county agents are expected to spend the time with the station men and with the college instructors. The research men interpret their results to the field representatives while the extension men bring problems met with in the State to the station men. Through this medium the results of station work are placed before the farmers. The county agents get in touch with the experiments while they are in progress and follow them until they are completed, bringing in criticism from the field that is often most helpful. They are the fingers with which the station man gets in touch with the farmer.

The Chairman. After the program was made up and distributed, with great sorrow we learned of the death of Director J. H. Kastle, who was to have taken part and at this place in the program. Dr. A. M. Peter, long connected with the Kentucky Experiment Station, and an associate of Dr. Kastle, is present with us today, and will say a few words to the section in memory of our departed associate.

Director Joseph H. Kastle

By A. M. Peter

On September 24th of this year, the Kentucky Agricultural Experiment Station suffered a great loss in the untimely death, after a short illness, of its director, Doctor Joseph H. Kastle.

As a chemist his researches had made notable progress in the field of biological chemistry; as director his ability in conducting investigation

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was showing itself in the increased activity along many lines of agricultural research at the Kentucky station, thus making his loss a severe one to the agricultural interests of the State. It is, therefore, appropriate that we pause in the program of this section to recall briefly some of the principal facts in Doctor Kastle's life and work.

Joseph Hoeing Kastle, only son of Daniel and Thane Vallandingham Kastle, was born in Lexington, Kentucky, January 25, 1864. His early education was acquired in private schools in Lexington. He was graduated from the Agricultural and Mechanical College of Kentucky with the degree of Bachelor of Science in 1884, receiving his Master's degree two years later from that institution. He took the degree of Doctor of Philosophy at Johns Hopkins University in 1888, where he was a favorite pupil of Dr. Ira Remsen, chemistry being his major study. The same year he was placed at the head of the chemical department of the State College of Kentucky, which position he filled with distinction, producing much original work, under great difficulties, until 1905, when he became Chief of the Division of Chemistry, United States Public Health and Marine Hospital Service. This position he resigned in 1909 to accept the chair of chemistry in the University of Virginia, which he filled until 1911. His official connection with the Kentucky station began July 1, 1911, as head of the department of chemical research which had just been established by Director Scovell. At the death of Doctor Scovell, Doctor Kastle was elected director of the station and dean of the college of agriculture. He held the combined position until only a short time before his death, when he was relieved of the duties of the deanship on account of failing health.

Doctor Kastle was married in 1895 to Miss B. Callie Warner, who survives him, with two daughters, the elder of whom is now a senior in chemistry at the University of Kentucky.

Time does not permit us to recount Doctor Kastle's achievements in chemistry nor to list his numerous scientific publications. A catalog of his more formal papers comprises some 110 titles and he was a frequent contributor to farm journals and to the daily press. Perhaps his most striking work was that on oxidases, begun while he was professor of chemistry of the State College of Kentucky. This was then a new subject, but one which has proved to be of the highest importance in the chemistry of plant and animal life.

Doctor Kastle's position in the field of American research at this period was unique, in that he brought to the work a keen intuitive vision; great skill in device and adaptation; unusual industry and enthusiasm; and a firm belief that early publication is an essential part of every problem. Trained as a chemist, his success was due to the application of the exact methods of chemical and physical research to the complex problems of biological chemistry which had so far baffled human endeavor. His work was soon followed by important results. More than one-third of the total number of his formal papers dealt with biological subjects and these papers thoroughly awakened the scientific world to the fact that metabolic activities are of the nature of fermentations.

The demonstration of the reversible action of lipase was of special importance for the reason that lipase acts on all the fats proper, and the results obtained applied to all food fats. Moreover, he employed this reversible action to demonstrate the presence of lipase in various tissues. Throughout his life and to the very end, work was his constant inspiration.

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The following subjects may be mentioned as having occupied his attention, in collaboration with other members of the station staff, during the time of his connection with the experiment station: Parturient paresis and eclampsia; the toxic character of the colostrum in parturient paresis; the internal secretion of the mammae as a factor in the onset of labor; calcium salts and the onset of labor; the composition of the ash of the sap, leaves and stem of the wild grape vine; simplified methods of water analysis for sanitary purposes; evidence of the action of oxidases within the living plant; translocation of mineral constituents of seeds and tubers of certain plants during growth; the amino-acid content of certain feeding stuffs; and the feeding of young chicks on grain mixtures of high and low lysine content.

Doctor Kastle was a teacher of eminent ability. He possessed in the highest degree that inborn faculty of inspiring his students with the desire to think out and work out for themselves to the uttermost analysis, the problems put before them. The example of his contagious enthusiasm and untiring industry was as irresistible as his scientific foresight was remarkable. In short, he was a never failing inspiration to his associates and fellow workers. But of himself he spoke with becoming modesty and his point of view cannot be better shown than by closing this paper with a quotation from an address he delivered only a short time before his death:

"And so, if my own life affords any satisfaction to you or to anyone it is by reason of the fact that it has afforded some opportunity to hold up before many generations of men younger than myself, the high ideals of hard work and unceasing application, as the great fundamental requirement of happiness and success. The idler has always been, and ever will remain, the great malcontent in the world's civilization, and it is only the busy and industrious man who has the remotest chance at real happiness. To have preached this gospel and to have practiced it, at least in some degree, I regard as the greatest contribution that I have been able to make to the world's progress and advancement, in the humble sphere in which I have lived."

THE CHAIRMAN. The section is indebted to Doctor Peter for his presentation of this tribute to our late associate, which, unless some other course is suggested, will become a part of the sectional proceedings.

Director A. F. Woods of Minnesota will now discuss the subject of the Relation of the Experiment Stations to Regulatory Work.

RELATION OF THE EXPERIMENT STATIONS TO REGULATORY WORK

BY A. F. WOODS

We had looked forward today to a discussion of this important subject by Director Kastle. His keen analysis and synthesis would have brought the factors involved clearly before us and he would have suggested a constructive solution. His loss is deeply personal to all who had the pleasure of his friendship and his wise counsel. By reason of his departure from among us, I have been asked to present the subject for discussion.

I shall have to present the subject from the standpoint of an investigation that I made two years ago as part of the work of a commission appointed by the Governor of Minnesota, to prepare a plan for reorganizing the civil government. It was first necessary to find out how the different

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states were providing for such work. Through our bureau of agricultural economics we corresponded with the various state organisations and received reports from most of them. A summary of these reports shows that nearly three-fourths of the States have distinct departments of agriculture, whereas the remainder combine this work with that of immigration, commerce, labor, and industries. These organisations were established in the main by legislative enactment and only exceptionally in the constitution.

While the purpose of these state departments has been to promote agricultural interests in general, the main incentive at the outset was to provide a body that could conduct a state fair. The two departments organized in the forties and the half dozen started during the fifties of the last century, were created largely in response to this need. Even now, the whole function of the boards of agriculture in several states appears to be that of managing a state fair, and the supervision of county fairs. The importance of additional functions has gradually developed until these departments have now become leading administrative bodies in many states. They publish information and enforce laws designed to further agricultural development.

While the growth in numbers has been fairly uniform from decade to decade, there has been no uniformity established in the forms of organization adopted in the various States except that a board system was generally resorted to prior to the seventies. These boards were usually made up of representatives appointed by the governor, from congressional districts or county agricultural fair societies, or members appointed by the latter organizations. Such boards now exist in upwards of 20 States.

In about half of the States regular departments of agriculture exist with a commissioner of agriculture in charge. In most of the Southern States this official is elected with a popular vote. In many of the Northern States he is appointed by the governor or by the state legislature. Besides boards and departments, we have combinations of these, where a state department is under the supervision of a board of agriculture, and bureaus which are similar to boards but which also include immigration, statistics, mines, labor, and industry. Michigan differs from all other states in having a state board of agriculture created solely to look after the State Agricultural College. The funds used in supporting the state organizations for agriculture are secured in the main through legislative appropriations, although revenues from the inspection of fertilizers and of receipts from the state fair are used in a few instances.

BUREAUS

The functions exercised by the various agricultural organizations vary from state to state and are largely determined by local conditions. Where bureaus have been established, the scope of the work is largely statistical. In Arkansas, the bureau deals with agriculture, mines, and manufacturing; in Florida with immigration and agriculture, including the supervision of public lands and state prison; in Idaho and Montana with the interests of immigration and labor as well as general statistical work; in Kentucky with seed distribution and institute work as well as general statistical work; in Tennessee and Washington with immigration and statistics.

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BOARDS

The boards of agriculture are not connected with state departments in such States as California, Colorado, Connecticut, Illinois, Indiana, Kansas, and New Jersey. Such boards are usually made up of a group of men prominently identified with agricultural development in various sections, whose services are secured gratuitously. Matters of administration, however, must needs be done by a salaried secretary devoting full time to such work. As long as the function of the board is limited to a few undertakings and largely involves questions of policy, the board system serves a very useful purpose, but as soon as the promotion of agricultural interests is made a definite program, the administrative duties connected therewith make necessary the employment of salaried officials.

STATE DEPARTMENTS OF AGRICULTURE

In a few States, such as Idaho, Montana, North Dakota, and Washington, the commissioner of agriculture simply collects and publishes statistics bearing on agricultural resources, while independent boards are vested with policing powers. Most state departments, however, vest in the commissioner of agriculture certain policing functions; such as state inspection of orchards in Texas; inspection of pure feeds and foods and factories in South Carolina; inspection of pure food, feed stuffs, fertilizers, drugs, orchards, nurseries, apiaries, oils, etc., and the prosecution of offenders of the laws relating to agriculture, in Pennsylvania and North Carolina; control of the live-stock sanitation and fertilizer inspection in Mississippi; whereas in Georgia a state chemist, entomologist, geologist, pure food commission, oil inspection department, and veterinary boards all report to the commissioner of agriculture.

WORK DISTRIBUTED BETWEEN STATE DEPARTMENTS, AGRICULTURAL COLLEGES, AND EXPERIMENT STATIONS

Where a state department of agriculture is created, it becomes necessary to establish a line of demarcation between its work and that of the agricultural college and experiment station. Where one of the above agencies, however, lacks suitable facilities, it often happens that certain of its functions are partially met by one of the other bodies. Much remains to be done in a majority of the States in order to establish a logical distribution of functions such as is indicated above. The following summary, touching on 14 important activities, illustrates the haphazard arrangement adopted among the various States:

Live Stock Sanitation.—This is rarely handled by experiment stations or agricultural colleges. The work is about evenly divided between state departments and separate boards. In some cases the stations cooperate in diagnosis and research work.

Nursery Inspection.—Most of the nursery inspection is handled by state departments. In a third of the states, it is left to experiment stations and agricultural colleges, between which it is almost evenly distributed.

Stallion Registration.—Most of the States have made no provision for stallion registration. Half a dozen states leave it to separate boards. In but one or two states do we find such work connected with the agricultural college, experiment station, or the state department.

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Feed and Fertilizer Inspection.—This work is almost evenly divided between state departments and experiment stations. In some instances where the state exercises police control the chemical analyses are made by the experiment stations or agricultural colleges.

Dairy and Food Inspection.—A few states handle this through the experiment station. A larger number of states have no law controlling this work. Legislation, wherever adopted, usually leaves it to a state department or a state board.

Forestry.—In a few states it is handled by the experiment station. Where forestry laws have been passed, it has been customary to place this work in charge of a state department or state board. More than a dozen states have no such legislation.

Farmers' Institutes.—In a dozen states the farmers' institutes are conducted under the management of the agricultural college. A larger number of commonwealths have placed this work under a state department or a state board. In some instances such states cooperate with the agricultural college. Iowa has an independent county plan.

Drainage.—Most of the States have made no provision along this line. Less than half a dozen leave it to the experiment station and as many more report to separate boards. It is exceptional to find a state vesting such control with a state department or a state board.

Highways, State Lands, Immigration, Game and Fish.—Where legislation has dealt with the above, it almost invariably places the work with state departments and state commissions. No legislation along these lines exists in a number of states.

Grain Inspection.—Most States have no legislation bearing on this matter. Where laws have been passed, the control has usually been placed with a state department.

Soil Surveys.—Nearly half the States have done nothing along this line. Where attempts have been made the Federal Government has often helped the State, as well as the college and station. In some instances the State cooperates with its own college and station. It is work with which the station should be closely identified.

PLAN SUGGESTED

No single plan will be adapted to the varying conditions of the several States. In all cases, however, certain fundamental principles of organization must be kept in mind. The demands of efficiency make imperative a centralization of administrative authority and a correlation of functions. The former points to a state department with a commissioner in charge; the latter implies the need of coordinate bureaus within the state department.

The plan recommended by the Minnesota commission included a department of agriculture, coordinate with five other departments, under a director appointed by the governor. The department was divided into the following groups: (1) dairying, (2) animal industry, (3) plant industry, (4) exhibits, (5) immigration. An advisory board of five members appointed by the governor was also recommended. All appointments, except that of the director, were to be under a strict civil service. Experience everywhere has shown this to be absolutely essential to honest and efficient work. The plan provided for the closest cooperation between the state

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department and the university and provided that police powers in reference to agriculture shall be exercised by the department and that the university shall retain its present powers and duties in obtaining and disseminating information and conducting agricultural research and shall retain the custody of scientific collections.

While the recommendation has not as yet become law, it is in actual operation between the university and the live stock sanitary board, the state dairy and food commission, the stallion registration board, the state inspector of apiaries, the state entomologist, the state forestry service, and several other bureaus. The present law provides that the station entomologist shall be state entomologist. His budget and operations are otherwise entirely independent of the experiment station, except as above described.

When the volume of work is not large, this is perhaps the most economical way. Scientific and research contacts between police and administrative bureaus are valuable to both. It makes available to the state bureau the most efficient means of solving research problems by a disinterested third party at a minimum expense. It brings the laboratory men in touch with the vital state problems but takes away from the laboratory the expense of routine inspection, the preparation of court cases, and the odium of conducting prosecutions, all of which are research-killing by nature as well as by consumption of time, energy, and money.

On the other hand, a police bureau that is obliged to depend upon itself for the solution of its research problems, is diverting its energy from its real function and will therefore be less efficient.

In brief, the better type of organization is specialization and cooperation.

I believe this should apply to our great government departments and bureaus as well as to the colleges and stations. If we are ever to have a University of the United States, I believe it will come by combining all of the educational and research functions into a university group independent of but cooperating with the police and administrative bureaus.

Since completing this analysis of the situation from the data secured in my own investigation of the subject, I have received from Acting Director Alfred M. Peter of the Kentucky station, the data collected by the late Doctor Kastle. A letter of inquiry was sent to the directors of the 49 experiment stations in the United States. Replies were received from all but three. The results in general correspond closely with those secured in the investigation which I have reported. Several important points have been especially emphasized in this correspondence. The Kentucky station is a good illustration of how regulatory work may be handled by a station successfully. I quote from Doctor Peter's letter transmitting the correspondence.

"As far as Kentucky is concerned, the experiment station does practically all of the regulatory work, including the inspection of commercial fertilizers, feeding stuffs, foods and drugs, nursery stock and field seeds. We manufacture and distribute hog cholera serum, but its administration is under the control of the state live stock sanitary board which looks after the diseases of live stock generally, though with more or less cooperation from the experiment station. The sanitary inspection of dairies, bakeries, and slaughterhouses is done by our food department, which also tests insecticides and fungicides, these being regarded as coming under the

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provision of the law relating to the sale of drugs. The experiment station cooperates in the state forestry work, but has nothing to do with the administration thereof, there being a state forester entirely independent of the station.

"In regard to the question whether regulatory work is helpful or inimical to the best interests of the work of agricultural experiment stations in general, I will say that while, as a general proposition, such work has no direct connection with the experiment station work proper, I do believe that it is practically helpful. I think that I can say, without fear of successful contradiction, that such work has been exceedingly beneficial to the Kentucky station. Indeed it was founded upon the law regulating the sale of commercial fertilisers in the first place, before the passage of the Hatch Act; and without the provisions of that law, which allowed the station to use money accruing from fees, there would have been no funds with which to conduct our work. It is to be noted, however, that our regulatory departments are practically independent of the departments of investigation. Conducted in this way, the several departments can be mutually helpful without interfering with each other's work. I would not be in favor of having regulatory and investigation work conducted by the same men. Although we do this in one of our departments, I do not think that it is desirable, and, in the case referred to, the head of the department merely supervises the inspection work, which is carried on by separate assistants.

"Another feature of inspection work which has been very helpful to us is the opportunity which it gives us of making friends for the station all over Kentucky. We have tried to handle the regulatory work in such a way as to settle differences by conferences and arbitration rather than by prosecution. Although it was necessary at the beginning of the food work to prosecute many cases, we have found, in all lines of our inspection work, a general disposition among manufacturers and dealers to conform with the requirements of the law, and prosecutions are becoming fewer every year.

"There is one other phase of our work that brings us in touch with the people of the State, which is in a sense disadvantageous. We are asked to do a great deal for the people in the way of testing things that are of interest to the individual and not strictly in the line of investigation. For example, we test a great many waters, ores, minerals, and the like, and make quite a number of examinations for poisons, without charge to the individual or to the court requesting the examination. This is not properly regulatory work, neither is it station work, but it brings the station favorably before the people. That was of considerable advantage in the early days, but it is possible that after a station has become well established, and with the proper cooperation of the extension department, such activities ought to be discontinued."

Similar views were expressed by several of the station directors.

There was a general concensus of opinion that regulatory work could be honestly and efficiently carried out only under conditions free from politics and frequent change of policy. These can be found outside the station in general only where a strict civil service is in force. The directors expressed themselves as a whole as favoring the assignment of regulatory work to state departments or, in cases where it was necessary that the station handle it, the organization of distinct units.

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T. P. Cooper of North Dakota. I shall merely attempt in my discussion of this subject to present a new form of organization that has taken place in North Dakota this year in relation to our regulatory work, believing that possibly it may be of interest.

Regulatory work has generally been developed either as a specific function of state government, or as a function that has been assigned to the experiment station, although in many instances the police duties of a state have been divided, a part being assigned to the experiment station while still other features are relegated to some state department, the two often showing no relationship. Such a condition offers opportunity for differences of opinion and possible conflicts which may seriously interfere with the proper development of control duties. Experience in several states would seem to indicate that while a certain relationship should exist between the experiment station and control work, it is questionable whether control work should be carried on by or through the experiment station. It is my opinion that such a relationship should exist as will not affect the fundamental work of the experiment station or create a situation which will lead to the overtaxing of the station's finances or laboratory resources.

Control work, in some instances, has prover more popular than investigational work. It has offered an opportunity to bring about contacts with the people and to develop departments. In consequence, a tendency has developed upon the part of some station departments to create features of control work within themselves. Such developments may at the outset seem advisable, because of the fact that the experiment station is the only organization which is in a position satisfactorily to handle such work. However, it sometimes happens that with the development of control work resources become strained and laboratory room, equipment and service funds diverted, often to the detriment of research work for which the experiment station was organized.

Efforts satisfactorily to solve the relationship that police work should bear to the experiment station have varied from definitely developing control work under the State Government, with or without the cooperation of the experiment station, to bringing about a closer relationship of this work within the experiment station itself. This has developed to an extent where frequently men are employed in the dual capacity of employees in the control department and investigators in agricultural research. The latter named condition sooner or later appears to cause administrative difficulties. Regulatory work makes definite demands upon one's time. Attention must be given to problems of law enforcement, or of control of a product, as the situation arises. Investigational work, on the contrary, does not make an appointment with the man which cannot be avoided or relegated to a later date. As a consequence research work suffers and police work is advantaged.

EXPERIENCE IN NORTH DAKOTA

An attempt has been made at the North Dakota station to place control work upon an improved basis. Sundry lines of regulatory duties at various times have been made a part of its work. Two years ago the first attempt was made to differentiate the work of men between control duties and agricultural research. During the present year a new relationship, involving greater differentiation, has been worked out and put into effect. The several lines of control work under the authority of the board of regents, relating to

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pure food, beverages, feed stuffs, nursery inspection and pure seed and the like, have been grouped as regulatory work. This group has been placed in charge of a director and made coordinate with the station or the extension work. This form of organization has resulted in definite lines of demarcation. Men are employed either for control service or for investigational work, but not for both services. Laboratories are separately equipped, although in the same building. The funds of the experiment station become fully available for research work and are not assisted by, nor do they assist, the funds appropriated for regulatory work. The control work stands upon its own feet. It is expected that future control duties which may be developed will be assigned to this group.

This system of organization has been in effect since July 1 and gives promise of satisfactorily solving the problem of relationships from the standpoint of the station. It is our opinion that control work should not be dependent upon the station, but that the relationship may be close, providing lines of demarcation are clearly established and men are employed solely for the one purpose or the other. Frequently laboratories may be used in common. Equipment may be made available to the regulatory service at no material loss to the station.

THE CHAIRMAN. The Chair appoints as committee on nominations Directors H. A. Morgan of Tennessee, Arthur Goss of Indiana, and C. P. Gillette of Colorado.

On motion, a recess was taken until Thursday, November 16, at 2 p. m.

AFTERNOON SESSION, THURSDAY, NOVEMBER 16, 1916

The section was called to order at 2 p. m. by the chairman, B. W. Kilgore.

THE CHAIRMAN. The topic before the section this afternoon is the "Correlation of Work of Experiment Stations in Regions with Similar Conditions. The discussion will be opened by Director J. C. Kendall of New Hampshire.

CORRELATION OF THE WORK OF EXPERIMENT STATIONS IN REGIONS WITH SIMILAR CONDITIONS

BY J. C. KENDALL

We live in an age of specialization, in a time when efficiency is the keynote of business and manufacturing and when agriculture has felt its influence. Our agricultural experiment stations, too, are reflecting the trend of public opinion. Administrative officers and governing boards are conscientiously studying the state and federal laws creating experiment stations, and are regulating their activities with a view of placing them on an efficient basis. Not only do station standards and ideals seem higher than in former days but recent fundamental changes have made it possible to effect modifications in station policies which were not to be considered a few years ago.

Probably no single movement since their establishment has exerted such an influence upon the type and character of their work as the development of extension activities which culminated in the passage of the Smith-Lever Act, recognizing for the first time the parity of non-resident teaching

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as a national movement with those of teaching and research. Its passage has brought about many readjustments of functions aud duties, most of which permit greater specialization in teaching, research and extension activities, thus enabling the several institutions we represent more effectively to serve their constituencies. Station staff members need not devote as much time and energy as formerly to classroom and non-resident work. If they are well trained and effective research workers, they should not be burdened with administrative duties, general correspondence, classroom work and miscellaneous effort. Good teachers and extension workers are more easily secured than are good research men. To be sure, extension activities seem temporarily to occupy the center of the stage, but research will in time come to its own again; for only by continued experimentation can agriculture progress.

I have mentioned a few of these generalities because of their bearing upon the subject of this paper. I did not issue the customary questionnaire, out of sympathy for my co-workers. The statements made and opinions expressed are based upon personal observation. No attempt has been made in detail to cover this assigned subject. A few instances only are cited and a few suggestions offered as to possible correlation.

Not many attempts have been made by the stations to correlate their work with that of other stations located in regions with similar conditions. Attention may be called, however, to the fact that for 33 years the directors of the New England, New York and New Jersey stations have conferred annually in early March. At the outset these meetings were called to consider the matter of trade values of commercial fertilizers, and for many years the discussions were confined to this one topic. The desirability of establishing uniform values in this region of similar trade conditions was early recognized. As the years went on the scope of these conferences was enlarged and administrative and technical matters were discussed. There has been a tendency during later years still further to broaden the range of discussion and to consider to some extent the various research and regulatory projects that are in hand in the several stations in this region. At the 1916 meeting each director agreed to send a list of his active projects to the other directors before the March, 1917, meeting. This action clearly indicated an interest in regional problems and will doubtless lead to a more intimate knowledge on the part of the several station staff members in these eight states of what is being done in research lines at their seven sister stations. It may be remarked, parenthetically, that the station chemists in the North Atlantic States have met with the directors for several years and that they have been working cooperatively upon questions dealing with the availability of organic nitrogen in commercial fertilizers.

At a recent special meeting held at Hartford, Conn., the several directors discussed with a representative of the Federal Weather Bureau the advisability of attempting more closely to correlate some of their field work with the weather records obtained in the several States, and of attempting to make a special study of a few leading crops of the North Atlantic region in respect to their meteorological relations. If such work is undertaken, clearly it would be desirable to see to it that it is carried on in the several States during the same season with the same crop and under as nearly as may be the same conditions. This is an excellent and concrete illustration of the matter now under discussion.

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The work of the Association of Official Agricultural Chemists is a case in point. Its chemical methods may not have proven satisfactory in all respects, but at least they have become to a large degree unified and standardized as a result of their collaboration, and new contributions are being made yearly and a higher degree of perfection attained.

This Association, in convention assembled, illustrates the advantages that may be derived from nation-wide cooperative effort. It would be sheer waste of time in this presence to do more than mention the mere fact. Its manifold advantages suggest themselves and further suggest the benefits which might be derived with sectional conferences dealing with local problems. The authors of the Hatch Act clearly realized the desirability of establishing close relationships between the Federal Department and the new born stations; for that enactment prescribed that "in order to secure, as far as practicable, uniformity of methods and results in the work of said stations * * * (the Secretary shall) * * * furnish forms, as far as practicable, for the tabulation of results of investigations or experiments; * * * indicate from time to time such lines of inquiry as to him shall seem most important, and, in general, * * * furnish such advise and assistance as will best promote the purpose of this act."

The Office of Experiment Stations, by many years of careful and tactful supervision, has thoroughly justified its existence. The satisfactory status of the station enterprise today in no small measure is due to its wise counsel and assistance. The Smith-Lever Act could not have come into being had the stations been false to their trust. Had they yielded unduly to popular pressure and to the demands made upon them to do demonstration and miscellaneous extension work, its passage would have been delayed and the enactment of satisfactory legislation imperilled.

The New Hampshire station encourages its research men to visit other stations, universities, technical schools and commercial plants and to meet and consult with investigators working along similar lines. The smaller stations obviously cannot secure the services of many high grade specialists, scientists with as wide training and experience as are possessed by some of the men at the larger institutions. There seems no good reason why a free exchange may not occur between stations dealing with similar problems within a given region.

The Adams fund can "be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States." Agricultural research has been defined as "an effort at the discovery of the fundamental facts and principles underlying agricultural practice." If we accept this definition and try to carry out the spirit of the Adams Act, we will not emphasize state lines but under the right conditions freely cooperate with a view of "doing our bit" to best advantage.

Attention has been called by one of the "elder statesmen" among us to the far reaching possibilities which would result were we able to pool all of the funds appropriated to the stations of the North Atlantic States and to establish one station with ample facilities and a full corps of well-trained men, leaders in their several specialties. His statement is significant. Of course such a plan is now impracticable; but we can in smaller measure realize its potentialities if we get together more with a view of promoting regional correlation.

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May I make two direct suggestions as to possible phases of correlation in regions where the agriculture, topography and general climatic conditions are sufficiently similar to warrant attempts at cooperation.

I suggest:

(1) Annual conferences of directors for the consideration of administrative problems, the development of plans for further cooperative work, the review of active or proposed research projects and the inauguration of regional enterprises. May I develop this latter proposition to some extent. The successful prosecution of a project frequently involves the active cooperation of two or more station departments. Some may be well equipped and others ill-equipped to handle the work. Now, if the project were established on a regional basis it might be better prosecuted. If, for example, the X and Y stations cooperated in a project involving, let us say, botanical and forestry investigation, and if at the X station the botanical department was relatively strong and its forestry department relatively weak, whereas the situation was reversed at the Y station, it is clear that, theoretically at any rate, an attempt at regional collaboration would be advisable in the interests of the completion of a well rounded piece of research work.

(2) Joint publication of certain bulletins. Much duplication exists in our literature, particularly in our extension publications, in the preparation of which, in many states, station men are more or less used. If the executives of the stations within a given region were well advised as to each other's plans touching publication, it might often occur that bulletins prepared for one station could be used to advantage at another, thus saving time, effort and money. Indeed, in a special case a year or two ago in New England, this proposition was discussed and nearly brought to the point of adoption; but as a matter of fact it did not eventuate. However, something of this kind will be worked out some day and to mutual advantage.

E. H. JENKINS of Connecticut. There may be at least two kinds of correlations, as I understand the word. Stations in two or more states which have taken up a common problem in any one of the provinces of our work—in feeding, or crop production, for instance—might correlate their work by agreement, each taking a separate phase of the problem, thus dividing the work between them without duplication. Such an arrangement assumes a previous agreement as to the scope of the work but not necessarily as to the method of study. Each station may be left to devise its own way of handling its phase of the matter.

A second kind of correlation might consist in a common definition or statement of the problem, as in the first case; but instead of dividing the problem into its phases or parts by assigning one part to this station and another to that, there might be a further discussion and agreement as to the method of study, and the plan and detail of experiment, so that the work of two or more stations would be a good deal like the duplicated work of two chemists following the same method and expecting results differing only by the faults inherent in the method and what we call the "personal equation." This kind of correlation works seems to me less promising than the first.

Such cooperation in work as results from an informal gathering and conference of the station directors of one small section, the northeastern states, including New England, New York and New Jersey, we have prac-

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ticed for many years and, I believe, to our great advantage. It is a gathering without constitution, by-laws, or rules of order. Its members are personal friends, who can debate a matter with absolute disagreement and with a high heat of conviction, but a quite perfectly insulated temper. Yet in all this time, any actual correlation of our work has never been suggested, that I now remember, by any of us, unless in some particulars of analytical method. Our whole thought has been of things which the special interests of leading agricultural industries required, and of research which the men and means available to us could undertake. We have not thought of a similarity of conditions in our several states.

Even in our small area, such "similarity of conditions" as is suggested in the title of this discussion is not easy to find. For instance, there is a difference of climate even between the southern and northern part of Connecticut, which makes certain crops or varieties that are safely grown in the southern part, of doubtful value in the northwestern part. Our soils, too, are as various as the vagaries of the streams in the glacial age.

But it may be that some of our questions can be better solved, or more economically solved, by some form of correlated effort, and I have hoped that some stations represented here might give us facts from their experience, bearing on this matter.

There is just a single matter of personal opinion which I might add to this discussion, not by way of objection or criticism of any plan of correlated effort in investigation work but rather by way of caution. In the higher forms of research work, I have a feeling that separate individual initiative and thought in the execution of a particular piece of work will in the aggregate go further and do more in advancing knowledge than work done after mutual discussion and agreement as to particulars of method and details; that is, two competent men attacking a problem separately, with their own habits of thought and ways of handling their mental equipment, will in the end advance knowledge more than the same men influenced and to some extent controlled by each other's habit of mind in the planning of the work and in the emphasis laid on its different features. In one case, you will have in the end two different distinct pictures of the matter; in the other, a composite picture, somwhat softened, but not so clear and suggestive.

A patriot in one of our cities to whom was intrusted the selection of a design for a soldiers' monument told me that he got photographs of a great number of soldiers' monuments and combined the best features of each in his design. It is sufficient to say that his creation "looked the part," and will stir feelings of pain and pity in a suffering public for long generations.

The one thing which seems to me important in any correlation of work is not to abridge the freedom or hamper the originality of the individual, if he has the mind and method of an investigator.

THE CHAIRMAN. Director W. M. Jardine of Kansas, will continue the discussion.

W. M. JARDINE. If I had taken the time to think clearly through this question beforehand, I would not have consented to discuss it. I know very little about the subject, and can cite no concrete examples. I can see clearly that stations may get together to advantage, that they may cooperate in their attack on some of the large problems of wide application. Yet I appreciate that any measures looking toward cooperation or correlation

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should be carefully considered lest the usefulness of our investigators be impaired by too much red tape or smothered in an officially deoxygenated atmosphere.

My conception of the probable trend of this discussion was unlike that of my predecessors. I had thought it had to do with the investigational work carried on by the station in its laboratory rather than with outside work; and my remarks, therefore, are to that end.

Correlation of the Work of Experiment Stations in Regions with Similar Conditions

By W. M. Jardine

From the point of view of a business man or a governing board it would seem that investigational work carried on by experiment stations operating in similar regions should be more or less closely correlated in order to eliminate unnecessary duplication and waste of funds, as well as to add most effectively to the present fund of agricultural knowledge. However, a close analysis of the conditions that surround and control experiment stations and their staffs demonstrates that experiment stations differ from commercial or other institutions. A desirable plan of operations for a commercial institution will usually fail utterly to produce results in an experiment station.

The promotion of research and investigation involves two things—(1) the abolition of as much red tape as possible, and, (2) the development of an environment tending to make individual effort as free as possible. The great discoveries of the past which have really added to the store of agricultural information have been the result of individual rather than of cooperative effort and this is as certain to be true in the future as it has been in the past.

In organizing the work of the experiment station, the promotion of individual effort should be constantly in mind lest investigations of high quality be hampered. Attempts at standardization of methods of research tend towards repression. While the systematic planning and standardization of experimental work would undoubtedly advance the quality of the investigations of the weaker workers, it would hamper the men who really make the advances in this field. It would tend to make each investigator a mere cog in a large machine, a mere routine worker, and would eliminate the love and enthusiasm for research on the part of the strongest men.

The bulk of the work under way at most experiment stations has been planned only after a thorough review of the literature relating to the subject and after as much first hand information as possible has been obtained from workers in similar fields. The societies representing, for example, the agronomists of the country, or the workers in animal nutrition, give much of their time to the discussion of methods of correlation and experimentation. Each agronomist is quite fully advised as to what every other agronomist of consequence is doing. The same is true of workers in the fields of animal husbandry, dairy husbandry, plant pathology, horticulture etc. Investigations are being carried on with a rather complete knowledge of what the other fellow is doing.

It would, of course, be valuable if each station could be completely informed of the experiments under way at other stations in advance of the

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publication of results, or if, in planning new lines of work, the experiences and mistakes of previous investigators in similar fields were available. A certain amount of duplication, however, tends towards exactness. Because a certain investigator has determined that the cafeteria system of feeding hogs is the most economical one under certain conditions, it does not necessarily follow, in fact it has been shown, that it is not the most economical method under other conditions. These are so dissimilar even in stations located under apparently similar regions, as for example, the Kansas, Nebraska, and Oklahoma stations, as to make it almost necessary that the work of each be more or less independent of the work of the other in order to solve the problems most acute in their respective territories. Even within the State of Kansas it is necessary to try out the results along the lines of most consequence to Kansas farmers in many places.

The best investigators have minds of their own, and likes and ambitions. They will do their best work when they are able to plan experiments based on problems in which they have a personal interest. They will never be satisfied to allow a committee to detail to them a particular line of investigation to carry on, either as a whole or as a part of an investigation embodying the cooperation of many stations. It looks as if the future of agricultural investigation would resemble the past, each workman working more or less independently of the other, wasting a little money here and there perhaps, but in the aggregate accomplishing the greatest good for agriculture in proportion to the amount spent.

It is the individual worker who will bring to light in the field of agriculture knowledge that will be fundamental and worth while. An unhampered opportunity for individual effort should be the paramount consideration. No investigator should be granted station money for a project until he has thoroughly familiarized himself with the work done along similar lines elsewhere, and if station directors will see to it that staff members do thus inform themselves, duplication will practically be eliminated and correlation promoted. Then the societies for agronomists, horticulturists, animal husbandmen, and others can talk things over together to still better advantage. While they may not have committees appointed to plan work for each, they will all go home with a more or less common point of view and sympathy of understanding. As one investigator in animal nutrition has said, competition is human, cooperation is divine. Most of those engaged in animal nutrition work are only normal human beings, as are the investigators in every field. Correlation, the watchword of today, sounds good, and on the surface it seems that we ought to be able to work together more closely; yet I cannot look optimistically upon such a plan.

I do not feel that cooperation is impossible, but that it is a local issue. I cannot see wherein we would be advantaged in Kansas, where conditions differ in one county as compared with another. Our important problems may be of little account in Illinois or New England. We are riding this word "cooperation" pretty hard at present, especially if we attempt to enforce cooperation upon our experiment stations.

THE CHAIRMAN. Clearly we are getting into the spirit of cooperation, actually cooperating perhaps without knowing it. I am told that two-thirds of the stations have filed project lists with our joint committee on projects and correlation of research. We could hardly have done this a few years ago. The fact that we are letting other people know what we are doing in-

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dicates that we are getting into the spirit of cooperation and becoming more liberal in our ideas.

F. B. MUMFORD of Missouri. Our agricultural experiment stations have not developed any significant cooperation. They work independently and, it must be said in general, efficiently. There is little of the spirit of competition among them, and yet it is probable that there exists a certain amount of rivalry in the development and completion of important projects.

Through this lack of cooperation much duplication has resulted. In some cases this has been unnecessary and could have been avoided. When one station has investigated and published a complete life history of the hessian fly, it is difficult to understand why another station in the same region should make the same investigation and publish the same facts.

If some plan of cooperation could be devised, it would be possible for one station to concentrate its efforts upon a smaller number of subjects and thus become an authority. It could afford to secure a more complete equipment and better trained investigators. It is not necessary that each station in a given region should undertake to cover the whole field of agriculture. In the study of regional problems, several stations could cooperate in a combined attack which would result in greater economy and yield more conclusive results.

The station organization itself may cooperate within itself. Lack of cooperation exists among the departments of some stations. They are not doing good team work. The solution of agricultural problems can seldom be completed by chemical studies alone, or by bacteriological investigations or any other single phase. A more complete and a more convincing piece of work can usually be done if departmental interrelations are established.

E. DAVENPORT. We are over-impressed by what we feel to be lost effort in the experiment stations. As a matter of fact great discoveries do not occur frequently, and every one of them is attended by much loss of time and effort, expended along lines which do not prove fruitful of results. The wreckage and waste in all great inventions is extreme; but we do not see it. We regard only the results and forget the loss in the contemplation of the final product. Our experiment stations, however, working with definite funds, have records of the total outlay, profitable as well as unprofitable. Even so, let us not be frightened at the unproductive increment.

It is inevitable that some loss should occur, for money and effort bestowed upon research is like bread cast upon the water or seed sown broadcast. Much is bound to be wasted, but the rest yields an hundredfold. It is easily possible to lose the main harvest by looking too closely after that which has fallen by the wayside.

J. G. LIPMAN. There is an apparent conflict in what has been said. Evidently, we have been considering the same subject from somewhat different angles. Perhaps I can make my point of view a little clearer if I cite an instance of research that supports the theory of those who favor cooperation. The University of California, the Kansas Agricultural College and the Maryland Agricultural College are studying in cooperation the effect of climate on soils, a very fundamental problem. It has been said that we are to study regional problems where conditions are similar. We want the broadest and brightest light on fundamental problems where con-

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ditions are dissimilar. We want to know whether there is such a thing as a soil biological flora, we want to know what available phosphorus or nitrogen may mean as affected by climate rather than by soil composition. There are any number of fundamental problems which cannot be understood in all their bearings because we are circumscribed by a rather narrow horizon.

When we discuss cooperation we ought to realize that none of us favor any curtailment of individual initiative or the lessening of individual independence. No one of us would claim that the large, complex organization is more effective in human progress than the smaller institution where the individual has much freedom; but after all is said and done, there are certain fundamental problems dealing with knowledge that is universal, that can only be solved by cooperation. I believe that there is room for cooperation among institutions like those we represent.

R. W. THATCHER of Minnesota. I have this minute returned from attendance at a conference of representatives of the stations of four adjoining states, looking toward the formulation of a plan for the cooperative study of a problem which is peculiar to the spring wheat district as a whole. That is concrete evidence of our belief that effective cooperation can be secured. Then there is another type of less formal cooperation which may operate beneficially. For example, one of the members of our staff spent some time at the station in an adjoining state for the purpose of studying certain methods of technic which were in excellent operation there, and returned with the belief that this same technic might be profitably applied to the solution of some of our problems. The question immediately arose whether we should duplicate at our laboratory the special equipment which was available in the adjoining state. We were invited at once, by our neighbor, to send to him our material to be tested out with his equipment and experienced operators. Such a procedure involves no formal administrative direction, but informally it permits us to carry on a certain type of research at much less expense and at little or no additional expense to the neighboring station.

J. H. SKINNER of Indiana. The animal husbandry men of several stations in the Middle West as a result of informal conferences have eliminated much unnecessary work and improved their methods of procedure so that it is possible to correlate results.

H. E. VAN NORMAN of California. Out on the Pacific coast we are constantly reminded of the fact that other institutions are not working upon the same problems with which we are confronted. Most of our problems are peculiar to our own section, and there can be no cooperation under such circumstances. Oregon's rainfall is higher than ours; Arizona's less than ours; Nevada's elevation is out of proportion to ours. Many of our far Western states have their own different isolated conditions, and cooperation is thus difficult or impossible.

E. W. ALLEN of Washington, D. C. A thorough understanding lies at the basis, or must be the beginning, of every attempt at correlation. I have no fear of duplication in strictly original research, but much of the work of our stations is not of that class. We really know little of the work in progress among our stations, because our projects have not been published and because in many instances the work is years behind in its publication. Hence there is lack of information as to projects which are

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being pursued from much the same point of view, and as a result there is repetition or duplication of experiments, frequently with slight variations which prevent their being compared or correlated. There is often, moreover, a failure to determine, or at least to state, the exact terms of the separate experiments. Such procedure not infrequently leads to confusion in the results of the work, because differences are found which can not be harmonized, and it is not possible to trace the exact relation between cause and effect. The soil or the climate, or a combination of the two, may be the cause of the apparent differences in results, and in other cases the current prices or economic conditions largely determine the conclusions.

One remedy for the shortage of funds which is being felt is to make the station money go as far as possible; and some measure of correlation, or the avoidance of the need of duplication or repetition, impresses me as a natural and quite feasible first step in that direction. Beyond this, a broader understanding of the nature, scope, and results of work done at other stations would tend to make the experiments more progressive and effective. There are many examples of successful collaboration in research, and of a division of effort in a given field. Opportunity for extending this practice in many lines has come to my attention, and I have noted a more liberal attitude toward cooperation, if there were some effective means of bringing investigators closer together or of keeping them posted. I believe this thought was behind the formation of the joint committee on projects and correlation of research some few years ago.

T. L. Lyon of New York. I have been interested in noting the cases of experimentation in which cooperation and correlation are effected between the different stations. The successful cases seem to cover the class of experiments that are rather simple in nature, that class of experiments the outcome of which to a certain extent can be foreseen and a definite plan for a long period devised when the experiments are started. That is only one class of experimentation, and by no means the most important class. We have a very different problem if we attempt correlation with the higher and more difficult kinds of research. In such cases the individual must be the means by which the end is to be reached, and the outcome is a factor of his ability as an investigator. In our efforts to save money and to attain efficiency of the kind that can be reported upon, one is tempted to adopt those plans which show well on paper, that indicate a considerable degree of economy. The tendency is to divert our station work into trials of that nature, and that is an unfortunate tendency.

The initiation of research work must lie with the experimenter. If cooperation is to be really effective, it must be the outgrowth of consultation between the experimenters. Opportunity for much consultation is afforded by meetings of scientific societies, and in this way and through the scientific journals communication is established between the workers in the various lines. Thus one can tell the lines of work in which he may receive help from other men. That is the only way in which true cooperation can take place. Cooperation cannot be effected by station directors getting together and deciding upon a plan of work. If the plan is not approved by and congenial to the men who are to do the work, it is of no avail; for in the last analysis a piece of experimentation to be successful must have the enthusiastic support of the men who are to do the work.

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E. H. JENKINS. I think all who have been charged with a station administrative work will realize that a research man cannot be ticketed and labeled so that he will be recognised anywhere; that the number of degrees he has taken or the amount of time that he has spent in preparation does not fix his status as an investigator; and that in every station there are some men who are good for certain kinds of research, who need and are helped by a definite plan and by some restriction upon their efforts to keep them to the task which is set before them, whereas there are others who need to be given their heads and allowed to do exactly as they please. If a man has the real spirit, the mind and imagination of an investigator, after a time his problem will lead him, and he must go whither his problem leads him, and he will do his most efficient work in that way. I should be willing to make a modest bet that these investigators whom Dr. Lipman has described in the course of their work would be led off into certain side paths, and that some one of those side issues might in the end prove more profitable than the special object they had set before them at the outset.

F. B. LINFIELD. Cooperation and some differentiation of work in dealing with certain problems, particularly those relating to the control of insect pests and plant and animal diseases, seem entirely practicable and desirable in our western country. In these fields of work where certain definite problems are to be met, division of work between institutions will accelerate our conquest of the problems.

Again, certain stations do not cover the whole field of agriculture. They specialize along certain lines of work. With the limited funds which are available it would be better in the interests of efficiency for one station to concentrate on a certain problem or group of problems and for another station to take up some other line of work. This is an administrative matter. The older and smaller states may be better able to do this than can we in the West, although in some ways our need is greater.

The problems of eastern agriculture have been studied for 50 years or more. We of the West have just begun our work. Many surface problems are still unanswered and deeper problems of research are also pressing. Our farmers are calling for information on many practical problems, the answers to which are necessary to their success. The more we can divide the field with our neighbors the sooner will the answers be ready. We have found conferences of men working along similar lines wonderfully helpful. We have held many such conferences with our neighbors, although they are 400 to 600 miles away. We find it profitable occasionally to send workers to Colorado, Washington, Idaho, Utah and elsewhere to see what is being done, how it is being done; and we find our neighbors are reciprocating.

ALFRED ATKINSON of Montana. As a concrete instance of cooperation, may I mention that the Cornell station and the Montana station are together conducting studies on the inheritance of oats. Five years ago both started with the same pure lines, and like measurements have been made on the five crops that have been harvested at each location. The results should show the effect of environmental influences.

W. M. JARDINE. Our specialists should be permitted and encouraged to attend meetings of their societies. Some of these are doing constructive work. For example, the American Society of Agronomy is engaged in classifying various cereals. A splendid piece of constructive work along this

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line was presented. recently to this organization by E. G. Montgomery. We believe in paying the expenses of a reasonable number of our specialists in attending these meetings, but this generous attitude does not seem to obtain everywhere. There seems to be a tendency to curtail rather than to expand in this direction. If specialists cannot get together, our research work will inevitably suffer.

The report of the committee on nominations was made and, on motion, was received and adopted (see page 167).

On motion, the section adjourned.

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SECTION ON EXTENSION WORK

Afternoon Session, Thursday, November 16, 1916

The section was called to order by the chairman, K. L. Hatch of Wisconsin, at 2 o'clock p. m.

The Chairman. The Chair appoints as the committee on resolutions, Directors C. R. Titlow of West Virginia, A. J. Meyer of Missouri, and H. J. Baker of Connecticut; as the committee on nominations, Directors C. S. Wheeler of Ohio, A. C. Cooley of New Mexico, and A. D. Wilson of Minnesota.

The framers of the Smith-Lever Act evidently believed that rural development of necessity was bound up with that of the individual farm and the elements of which it is composed. This idea is incorporated in the act which provides for extension instruction in agriculture and home economics. One of this morning's speakers suggested that the American farm should be looked upon as a unit which, like any working unit—like an army corps, if you please—had its workers, its commissary department, its engineering corps, its medical corps, all elements entering into an effective working organization. It is with this idea in mind that we will proceed to the discussion of the formal papers on the program, the first number of which is: "Home Economics Extension in its Relation to Woman's Work in the Home." This subject will be presented by Miss Edna White of Ohio.

Home Economics Extension in its Relation to Woman's Work in the Home

By Miss Edna White

Extension work along home economics lines has been of comparatively late origin, and, in consequence, its aims and methods are not very clearly defined. The desirability of undertaking a systematic study of homes with the idea of their improvement is quite generally recognized. The beginnings were made in cities and grew out of the work of philanthropic societies in attempting to relieve in some measure the results of home deterioration. Most of this work was spasmodic and unsatisfactory, but was undertaken in an effort to direct reform.

That such degenerate conditions exist also in the rural districts to a greater or less extent, cannot be denied. We have tenant problems, for instance, in Ohio, as in many other places; large groups of people who are not settled in the particular region, but change more or less. But there is great danger of confusing this particular demand for the amelioration of unfortunate social conditions with the aim and scope of extension work in its largest sense. The aim of extension work in agriculture has been to develop better farms by bringing to the farmers and helping them to apply the results of scientific investigations. If the work had been confined to the group of men who for any reason were unsuccessful in their business, the usefulness of the work would have been hampered, to say the least. The attitude of too many of our workers would seem to imply that home economics extension work is intended only as a reforming scheme. To speak so constantly of the "farm women and their problems" seems often to single them out as the only group of women who have failed to solve their particular problems. This is surely an unfair inference.

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To read many of the popular articles about the home and to listen to some of the talks given by extension workers, one would gain the impression that most of our work is carried on with the missionary idea of uplifting in the foreground. For example, the attitude of town and city club women along this line can justly be criticised. Last year an Ohio city club woman asked me what her club could do to uplift the farm women in their vicinity. I did not want to say very much, but those farm women were a very progressive lot, and certainly were in no need of being uplifted in that sense.

Now most people of intelligence, whether highly educated or not, are not asking to be uplifted by the efforts of some one else. Their homes are personal and private and they wish to express and develop their individuality there. Even the man of the house feels that such efforts at reformation are more or less a reflection on the ability of the woman he has selected to manage his home, and from his loyalty to her comes a little feeling of resentment; and loyalty being one of the chief virtues of the family it is not to be lightly tampered with. Tact and judgment and an understanding of the difficulty are necessary so that we may avoid even the appearance of evil.

In addition to this difficulty, we find everywhere a lack of understanding of what home economics means. To the average person it means one phase of the food problem, namely, cooking; and the average man is sure that his wife understands this part of her job, or at least will maintain that she cooks to suit him. When it is once understood that home economics covers as well the problems of nutrition, clothing, housing, household engineering and management, relation of business of the household to the business of the farm, division of income, care of children, family and community relationships, home economics extension becomes less simple. Most men and women are willing to admit that a study and discussion of these problems will help in the development of the home in much the same way as the study and discussion of agricultural subjects help in the development of the farm. But we are not always anxious to face new problems. New ideas are painful to most of us and the solution of many problems usually brings us returns only in comfort and happiness which are often less appreciated than is the financial reward that comes to the farmer.

The home problems of any group might be classified under the heads of health problems, labor problems, social problems, economic problems, and problems connected with children. Those of the rural woman differ to some extent and degree from those of the city woman, because of the environment. The health problem is probably more complicated, due to lack of remedial agencies; the labor problem is more pressing and difficult, because of isolation and lack of conveniences. In each case the environment affects the problem and the remedies to be applied. As extension workers what are we doing to help in the solution of these problems?

The first and most easily developed methods of reaching the women are, of course, the talks and demonstrations that make up a large part of all our extension programs. These are valuable in so far as they go and in many ways we are beginning to see the results of these efforts in the adoption of new and better standards. This fact was well illustrated by a recent experience at one of our fairs. Having judged a large number of exhibits we were told that if we judged our products according to score

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card standards no more exhibits would be sent; whereas as a matter of fact we received a request this year from those same people for a judge, they specified that the judging should be done in exactly the same way as heretofore, and the exhibit was larger than they had ever had before. So we do see, once in a while, a concrete evidence that our standards are making their way.

Not the least of the service rendered is the development of interest in home problems. A task that we regard as important and interesting is not drudgery. Through this agency the rural engineer has an opportunity to reach the men as well as the women and to show them the desirability of installing modern conveniences which have more to do with family welfare than is sometimes recognized. Right here it might be said that there is no inherent reason why much of this teaching should not be done by men, providing they have the personality and training to understand the problems. This teaching is a matter of individuality and not of sex, with the possible exception of work regarding the care of children, and even here a male physician of the right sort would be probably as acceptable as a woman. Indeed, instead of restricting the work to women, it is in many cases desirable to bring the masculine mind to bear on home problems. Most homes are partnerships. Just as the man may help in the solution of home problems, so the woman may, many times, contribute to the solution of the farm problems. We have an illustration of that point in some of our farm management problems, the question of keeping accounts. The farmer who has been in the field all day rarely has the energy to keep accounts. Our farm management people have been trying to interest the women of the household in keeping the farm accounts. Perhaps if the women keep the farm accounts and know at first hand as to the financial situation, a more rational consideration will be given to all the family needs and pieces of labor-saving apparatus may sometimes be purchased instead of farm machinery. The fact that labor-saving apparatus is not purchased is not always the fault of the men. The women, if they really acknowledge the situation, often have the feeling that the piece of farm machinery ought to come first, not stopping to consider the whole situation.

Because of the shortness of the time given by the instructor as well as the lack of the personal touch desirable in good teaching, there are decided limitations to the extension method of instruction, and we have found it necessary to attempt to develop closer relations with the individual women.

Just as in the work in agriculture it has been found that limiting the work to smaller areas has given better and more definite results, so there is the growing tendency to develop the women's work as well as the men's through county units. In the South this work of women county agents has developed rapidly through the boys' and girls' club work, but because of the differences in economic conditions and the general types engaged in rural work, the problem of the woman county agent in the North is not the same. It must be remembered, too, that the problem of the man county agent and woman county agent differ very materially. It is one thing to consult and advise the farmer about his business; it is another and infinitely more difficult thing to invade the privacy of the home and be of real assistance.

The agent who is to work directly with the home must be a tactful, sympathetic, broad-minded woman of training, who is familiar with rural

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conditions. The problem of selecting women for such work is not an easy one, and many times superficial qualifications have turned the scale as against adequate training. A woman of the right type, well trained, can be of much help in many problems—advising regarding selection of furniture and clothing, and as to convenient arrangement and equipment, teaching utilization of food and desirable household practices, planning for club work, and, in general, helping to improve the educational and social conditions of the community. However, the crux of the problem is the entrance to the home itself in the capacity of a trusted friend and counselor. That is the aim and hope of most of the county agents and has been more or less successfully accomplished.

At present, definite data giving results of such work seem difficult to secure. This may be due in part to the newness of the method, but it seems also to be due, in part at least, to the fact that in the main the situation is an artificial one. This visitor, no matter how sympathetic she may be, does not come in to take a definite place in this group, to assume any well defined relation except that of critic. There is frequently no way of demonstrating to this family that she is any better qualified to solve their problem than is the woman of the household. On the farm the question of dollars and cents frequently settles the status of the man county agent; it cannot often be the measure of the woman's success or failure. A possible solution of the problem might be the addition to her home economics training, of the training of a nurse. That would not mean that she would spend her time nursing the sick, but from a psychological standpoint to most people, the nurse and the doctor speak with authority. The housewife does not feel that she is as well qualified as is a nurse to judge of food and problems in general. The definite problems relating to the health of the family would undoubtedly be more freely discussed with a woman who had had a nurse's training and her advice would surely in most cases be heeded. However, it would not be desirable to have a woman who had only a nurse's training. A woman of such training would not be capable of instructing in home problems in general, her training is not broad enough. As a means of approach to the ordinary home, this combination of training ought to be of assistance.

There might be a tendency to overemphasize the health phase, but that is a matter that could be adjusted and it would give this home visitor definite status in the family group and insure her suggestion a respectful hearing without an antagonistic attitude.

Of the indirect methods of approach we feel that the children's work is by far the most effective. Sometimes we may feel that it is slow, but the impressions made on a child are more lasting and they are not set in bad habits. There has been some feeling on the part of some of the federal workers that this work should be handled by a particular group and should not be undertaken by the county worker. I presume this is due partly to the fact that this work is so fascinating that one is apt to become engrossed in it to the exclusion of every other interest, but surely to deny them the opportunity of working with the childrn is a real handicap. Many homes can be reached through the children that would otherwise never be open to the county agent. The children offer an easy and natural approach to most homes and in many cases the mothers will follow the lead of the children. In this way many conditions will be remedied that could be reached in no other way.

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I have in mind a situation that existed in a small community where we happened to have a school lunch. There was one home in the neighborhood that was much better than any other. The daughter of the household was going to the country school, and was interested in the school lunch; and I presume, from the things we have been told, that none of the neighborhood children had ever been in this home. The mother became interested in the work and asked the school girls to come to her house and prepare supper. Twelve little girls thus had an opportunity of working in a well-equipped kitchen and setting a good table. They learned many lessons in this way which otherwise they would have had no opportunity to learn; and the method of approach in that case was by way of the children. If the children are in school they may be reached through work planned for rural needs. There is a dearth of material along home economics lines adapted to rural communities. In Ohio we have attacked the problem through the school lunch and we have been surprised and gratified at the number of mothers we have reached as well as children. We find that the mothers are in the habit of coming to the school on the days they have this school lunch lesson presented, and they carry home a good many hints.

For children outside of school as well as for many in school we have the boys' and girls' club work. The possibilities of training and development through this work properly handled need no discussion.

So far it seems that our indirect work has in some ways brought the largest returns, but the tendency seems to be at present to try to develop the direct method dependent on personal contact. There are many stumbling blocks in the way and we need to proceed slowly in order to avoid as many as possible.

We need to realize that reforms that are real and lasting must come from the women themselves. Our part in the work is education, changing the attitude of mind regarding work, and, we might add, the attitude of mind of the men as well as of the women. Many of the difficulties, such as overwork and bad environmental conditions, are due to the lack of understanding and respect for women's work. Until the woman herself realises the importance of her job and the necessity of keeping herself in condition to attend to it, we will have this lack of adjustment. This is one reason that the work with children brings the results. "Train up a child in the way he should go and when he is old he will not depart from it." The new generation, because of the training it receives in home problems, will have a different attitude of mind and, therefore, less difficulty in adjusting itself to its environment. We need clearly to define our aim and then to measure our methods by it.

Any work is drudgery, if the elements of it are isolated and detached. It is only interesting and inspiring if it is viewed in its deeper relations to other things. It has been well said that "a woman who sees the detail of her home work in the light of broad knowledge no longer knows it as drudgery." A method that has not back of it this idea of teaching people to see things in their relations, no matter what the illustration selected, will not have lasting effect. The worker must seek to develop the right attitude toward the work and induce each household to study its own problems.

So much emphasis may be laid on the particular and incidental that one loses sight of the fundamentals. Principles must often be taught by particular problems. If the worker has the larger idea she will not fail to

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communicate it to the pupil. We can only point out the way; each household must work out its own salvation.

THE CHAIRMAN. The subject of the next paper is "Home Economics Extension in its Relation to Rural Engineering and Architecture," by Director R. J. Baldwin of Michigan.

HOME ECONOMICS EXTENSION IN ITS RELATION TO RURAL ENGINEERING AND ARCHITECTURE

BY R. J. BALDWIN

The field of rural engineering and architecture embraces a great number of problems which are of first importance to the home as well as the farm. In this discussion only those things will be included which relate most closely to the home and the condition which home economics extension aims to improve. Briefly enumerated, the problems of rural engineering and architecture which are related to the home economics field are—farm sanitation, including water supply anad sewage disposal systems, lighting plants for the house and other farm buildings, heating systems, power for home use and house-planning. Other things might be mentioned, but these will give definiteness to the discussion.

The relationship of each of these problems to the organization and management of the home is very close indeed. For example, the plan and method of pursuing daily tasks within the home is established to a certain extent by the location of the various units of the water and sewerage system. The location of the kitchen sink largely determines what system of kitchen management shall be adopted; establishes the relative location of other equipment within the room, and the paths which will have to be traversed countless times during a year of household work. Kitchen-planning has been given careful study by home economics workers, and the most efficient arrangements are a matter of record. In replanning a kitchen, which is done either consciously or unconsciously when a water system is installed, the new plan should agree with what is known of these better methods. The height of kitchen sinks, tables, tubs, etc., most convenient for women of various heights, has been worked out in home economics research, and new equipment should agree with these rules.

The system of laundry work, which includes sources of water, heat, power, and drainage, is also largely determined by the original plans furnished by the rural engineer. In the majority of rural homes, this task is still done in the kitchen, but great numbers of modernized rural homes, through the advice of extension workers, are providing separate rooms and equipment for this purpose. Even with such equipment the amount of energy expended in washing will largely be determined by the location of the room and the relative position and heights of the equipment used.

It seems now that one of the great problem of home economics extension is to reduce the total amount of labor required in each day's housekeeping. In this the first step is one of rural engineering as well as home economics; namely, to induce rural people to provide themselves with labor-saving equipment. The importance of this may be appreciated from data which shows that even in the better regions, approximately 90 percent of farm homes are without water and sewerage systems. To accomplish the greatest results from a demonstration of these things, the right advice

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must be given not only on the mechanics of installation, but also on kind, quality, location, and height of all units of equipment used. Here is the point where there is great need for a close association and cooperation between the rural engineer—or as some of us have chosen to say "household engineer," and the home economics workers.

The relationship of this work to home economics extension cannot be thoroughly appreciated until a somewhat careful review is made of problems which confront the household engineer. Farmers are found to be slow to decide in favor of new things unless they can see them in actual operation and talk with other farmers about them. The problem must, therefore, be approached through the demonstration method, and when a family has become interested to the point of desiring to purchase and install equipment, it is highly important to have the entire job successfully done in order that it shall continue to be a permanent demonstration to the people of that community. His second thought is to have as many as possible of the neighbors observe the installation of the system from time to time—or, better still, assist in doing the things which it is necessary to know, when improvements are to be made at their own homes. This means that personal supervision must be given to the work, with careful attention to all details—such as the location and construction of the septic tank; the laying and joining of sewer tile, drainage tile, and soil-pipes; the fitting of water pipes, and the working of valves and overflow drains.

Farmers are not as a rule skilled in the use of plumbers' tools, and plumbers are not usually available. It then becomes the responsibility of the household engineer to conduct his demonstration as a class of instruction on the cutting and fitting of pipes; packing joints in sewer-tile and soil-pipes; hanging sinks and a large number of details encountered in setting and connecting the various units of the system. This is particularly true of the construction of a septic tank which is a cement structure. The principles of cement construction must be known and carried out accurately before a successful tank can be built. Many farmers do not know how to mix cement properly, and the household engineer, to make his work a success, must often give instruction on building forms, reinforcing, and the proportioning and mixing of cement, sand and gravel. This should not be done in competition with local mechanics, but rather in cooperation with them. Such tradesmen as are found in rural communities and towns are anxious to observe demonstrations of this kind and take part in the work; thus preparing themselves to take such jobs for other farmers in that region. Hardware merchants, plumbers, and other dealers in such supplies are attracted by the opportunities for sales, when it is shown that these modern improvements are practical, and will come into general use.

After the entire water and sewerage system has been completed, and before the sewer, septic tank, drainage, tile and waterpipes have been covered, the household engineer finds an unusually fine opportunity for a demonstration meeting, at which the neighbors will be shown the details of the whole system, and will ask questions about its operation and expense. It has been interesting to observe that such meetings have been equally well attended by men and women. What they see is enough to convince both the man and the woman that even the simplest water system will be most valuable in the home. This is most important, because it is the man on the farm to whom we must look for action in bringing such improvement about. When such problems have been approached from the home eco-

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nomics standpoint, through instruction to the housewife only, results seem to be long delayed. It is with this in mind that the household engineer gives attention to men's meetings as well as women's meetings, at extension schools and institutes.

Practically every problem with which the household engineer has to deal, bears relation to the farm as a whole, or to the farm building group. The farm water system is incomplete without providing a supply for the farms as well as the home. The electric lighting plants always include leads to the stables, garage, and other buildings. The problem of power for use in the home, must largely be solved as one factor in the problem of power for the whole group of farm buildings. In designing and remodelling buildings, the adviser must deal with the farm as a whole, considering location, financial condition, relation to other buildings, etc. For such reasons, it seems that the service for the home cannot be separated from that for the farm, and the household engineer must consider the farm with its buildings and its farm house as the home unit on which his project is based. The results sought will constantly be home improvement, and in every sense the project will be one of home economics, but the associations in the work as regards methods, subject matter, and persons dealt with in the field, are even closer to agricultural engineering than to home economics. This will undoubtedly influence the location of the responsibility for the work within the institutions which the specialist represents, and place him with the departments of agricultural engineering. This should not in any way interfere with a maximum amount of cooperation with the home economics workers. A formal understanding on this point can, of course, be provided for through the project drawn to cover the work, and it can be coordinated through the office of the extension director.

In discussing this topic, it should be remembered that the county agent is a very active power in accomplishing results in matter of rural engineering. He is not, in most cases, a trained rural engineer; nor does he know how to associate the new equipment with the modern teachings of home methods within the house; but he does know where the need exists, and where the communities are in which successful demonstrations can be worked out. In bringing the household engineer and home economics workers in touch with such communities, he becomes an active agent in furthering the purpose of home economics extension work.

Plans are already in sight for this kind of a project in the junior extension clubs. Boys who have completed the first lessons of home handicraft may take up the installation of modern conveniences in their work of home improvement.

The household engineering project has been under way for two years in Michigan, and while the extension specialist in charge of the work has been responsible to the professor of agricultural engineering, the project provides for a cooperative relationship to the department of home economics. In carrying out his work, the household engineer has made a practice of submitting house-plans, kitchen and laundry-plans, etc., to the home economics workers, for correction and suggestions. The home economics workers, including women county agents, give lectures on the need for water and sewerage systems, etc., leaving the follow-up work to be done by the household engineer.

It has been found exceedingly difficult to secure quick results in promoting the use of these modern improvements, and such success as has been

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accomplished is evidently due to the fact that the specialist in charge has been a man who is not only a graduate engineer, but experienced in building involving carpentry, plumbing, electric wiring, and in the use of all kinds of power, heating and lighting systems. The home economics workers welcome such assistance on this phase of their problems, knowing that the work should be carried out through the demonstration method.

THE CHAIRMAN. "Home Economics Extension in its Relation to Rural Health and Personal Hygiene," will be discussed by Dean H. L. Russell of Wisconsin.

HOME ECONOMICS EXTENSION IN ITS RELATION TO RURAL HEALTH AND PERSONAL HYGIENE

BY H. L. RUSSELL

The prominence which has been given in this program to the consideration of home economics problems justly signifies the importance of this subject. It is not often that an educational association devotes a complete session of its necessarily short life to the consideration of a single question. But I think those of us who are interested in extension work recognize that in this development of home economics extension there is a most important problem, one which requires the most careful planning in order that the proper foundations for permanent development may be laid.

There have been a good many people who have felt that an agricultural college should give a large share of its attention to production and marketing problems; but those of us who have been most interested in this work realize that agriculture and rural life are synonymous terms, and whatever makes for better agriculture tends also towards better rural life. In connection with rural life problems, those of the home are dominant.

I do not like the nomenclature "home economics extension." As understood by most people it is too narrow a term. To me the term "home" is better than "home economics," because in the administration of college affairs we have come to consider that home economics work is primarily woman's work. The home problems, however, are not wholly women's problems. It is of course true that as she is the center of the home, the woman's work is the nucleus around which everything else is built. I believe, however, that extension workers should look at this matter from a broader point of view. We should carefully consider all of those problems which are connected with home operations. These may concern woman's work or they may involve some of those problems to which the efforts of other subject-matter departments in the college may contribute, and perhaps contribute more effectively than they could if that work were wholly confined to the home economics department itself.

Of course it is possible to have a department of home economics which includes practically everything of this sort. However, if this were done we would at once and in a needless way duplicate the other subject-matter departments in our agricultural colleges. To take this attitude would be a mistake, both from the standpoint of expenditure of money and in duplicating lines of work which are in progress in other departments.

Those problems which concern health afford the best opportunity in my opinion for us to introduce the home extension work. We all know that the farm woman, in general, is a good cook; that in the main she is

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accomplished in needlecraft; that she knows how to handle the ordinary home affairs. There are problems, however, as has been pointed out, that she cannot touch in a way that the home extension worker can, provided this is done by approaching the home through the medium of something which the mother may not thoroughly understand—namely, the health and welfare of the children, particularly of the infant.

Of course most mothers know more or less, as experience comes to them, about matters of this nature; but sickness and disease and the impending dangers which accompany them always strike terror into the heart of any parent. I believe that in the organisation of our work this is the best way in which we can gain an entrance into the home. Assistance of this kind is most readily accepted by the mother. The dietetic problems in connection with child rearing, while frequently simple, are so cogent and so imminent in her mind that the woman worker can reach the home through this medium and establish herself in a relationship which is much like that of the old-fashioned family doctor who has now disappeared.

By this statement, I do not mean that it is the function of the woman extension worker to undertake the treatment and the remedial handling of disease. Her work should be more in the nature of warding off disease. We are coming to recognize more and more that the problems of public health are preventive rather than curative. Those of us who have had any contact with the large universities that have maintained clinical departments, where the end in view is to prevent rather than cure disease, know the efficacy of this mode of approach. We further know that if proper channels are provided for such work, it is possible to prevent a large part of disease which normally would occur.

If your woman extension worker is well informed as to health matters so she can speak with emphasis, with knowledge, with foresight, and with tact, she can enter the home as she could not in any other way. After having established herself in this connection, it becomes a perfectly easy matter to move from the problems of the child over to the broader problems of the home. Through the medium of these problems, she may enter the kitchen and perhaps give suggestions in regard to the dietetic treatment of the child, or the infant, or perhaps the growing children in the family. In this way she comes in contact naturally with those conditions which enable her to branch out from that particular point of view into others.

These health problems are of the very greatest importance, and some of them are of much more importance in the country than they are in the city. In our public health work we are apt to look upon them as belonging largely to the city. In fact, the public health expenditures in our various states are evidence of this, as seen from the fact that the larger portion of such funds is spent among our urban populations. And yet there are distinctively rural diseases which often take heavy toll of our rural population.

Typhoid fever is usually regarded as an urban disease. This is because a city epidemic spreads with such rapidity, through the medium of an infected milk or water supply, that hundreds and sometimes thousands of persons fall sick almost simultaneously. Such a condition does not obtain under rural conditions because the total number that are susceptible and that can be reached through any single focus of infection is small in comparison with the number under urban conditions; and yet we know

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that in the aggregate, typhoid fever is a more important disease, numerically speaking, in the country than it is in the city. If the woman worker is armed, not with scientific information which would enable her to make the Widal diagnostic test for typhoid fever, but with general knowledge relative to the problems which revolve around the question of the incidence of typhoid, she very frequently could be of the greatest possible assistance.

Tuberculosis is not a city disease, as many of us have been led to believe. A bulletin published by an anti-tuberculosis association giving the tubercular history of a Wisconsin county shows 13 townships in that county to have a larger ratio of tubercular disease than the state average. This is not an isolated case, as many others might be mentioned. Of necessity the work of anti-tuberculosis associations has been carried on very largely in the congested centers. Now, who will take their message to the 35 or 40 percent of our population that resides under rural and not under urban conditions? The Public Health Service may in time do this; but in our extension service we have an organization that is in immediate and direct contact with all parts of the rural field. If the women workers who are going to engage in this work are armed with a fraction of the knowledge that the ordinary trained nurse now possesses as to these questions of communicable diseases, they will be worth an untold amount. We cannot figure their work in terms of dollars and cents, for we cannot weigh questions of public health.

Many will say that this problem should be relegated entirely to the medical field, but I do not believe that this should be done. It is not necessary that the woman extension worker have a medical education. You have only to look at the situation with reference to the decline in death rates from tuberculosis in order to appreciate the enormous value of simple educational propaganda. The doctors knew, treated, and handled tubercular patients for generations, and in spite of this the death rate constantly increased, until it became "the captain of the men of death." When these anti-tuberculosis associations were formed, however, the tide of this steady increase was stemmed and in the last decade the mortality rates in tuberculosis have decreased 25 percent. This has been brought about, not through the medium of the medical men or of those organizations trained directly or indirectly in the medical colleges, but very largely through this health propaganda which has been carried on by common people, people who have seen the enormous importance of this question and have taken hold of it from the standpoint of public service. Many of those men in the anti-tuberculosis associations have been medical men; but there have been more lay workers than physicians.

This class of problems, in my opinion, constitutes the most effective way in which we can introduce the work of women. The attitude which our Wisconsin home economics department has taken with reference to this work, both the general department and the extension workers, has been admirable. We have been very fortunate in being able to secure the wife of one of our professors who by good chance had had a nurse's training in her earlier years. She has gone out with missionary zeal through the length and breadth of Wisconsin, at great personal sacrifice so far as comfort is concerned, in order to carry to mothers information on those problems that are of such great importance to them. She is in almost weekly correspondence with many mothers all over Wisconsin who are making inquiries in regard to dietetic problems, inquiries which never would have

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been made, even of the country doctor, had it not been for the extension service. You can readily see that the entire atmosphere in the home with reference to this work from the outside is completely changing.

The last speaker mentioned the word "uplift." I feel as she does that if there is one thing concerning which we must be exceedingly careful and in which we must exercise the greatest caution, it is this question of "uplift." We can expect a decline in our beneficial influence the moment that we go before our farm people and say that we are going to "uplift" them. We must go to them with something that meets them as man to man and woman to woman, and we must present to them something which they need and which they themselves see that they need.

The great bulk of this work, so far as personal relationship is concerned, whether it relates to the health of the child or of the entire family, will revolve around the work of woman. But it would be exceedingly short sighted for us to take the attitude that it is to be confined largely and entirely to woman's work. The remarks made by the preceding speaker with reference to sanitation involve problems which in my mind can be much more effectively transmitted to the country districts through the medium of our agricultural and engineering departments than they can by the woman extension worker. It is true that the woman representative may stimulate the consideration of these advantages in the home, but after all they are primarily engineering problems. The subjects of ventilation, house construction, sewage disposal, and water supply, are distinctively projects of this nature. Subjects relating to horticulture or landscape design likewise bear a direct relation to the farm home. Many of our colleges also have departments of rural sociology which are directly concerned with problems relating to women as well as men. It would be a mistake for us to attempt to have this work entirely handled by a woman representative, because we will very soon reach the point where there will be a cross-fire with the other subject-matter departments that are concerned with certain aspects of these same problems.

By working in close cooperation, the woman extension representative, whether she is the resident representative in the community or whether she is the district representative going to and fro, upon call, through this or that district, can serve to stimulate and create a demand which can be supplied, so far as technical information is concerned, by these other subject-matter departments. In order that this may be done effectively it is highly important that there be a close correlation among them.

THE CHAIRMAN. Agricultural college people sometimes boast that the courses in agriculture have developed in a manner unprecedented in the history of the world. They can no longer claim that distinction, because the development in the courses in home economics has been of equal rapidity. Particularly is this true of late with reference to the extension phase of home economics work. There seem to be two ways of meeting this need: One through the resident representative sent out from the college who is not confined to any particular geographical area; the other through the location of a resident representative in a particular place. Each of these two types of work has its merits. It is with a view of hearing from both of these kinds of workers that the next two numbers on our program are presented dealing with "The Function of the Woman Extension Worker."

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Miss Agnes E. Harris of Florida, will tell us about "The Woman County Agent."

The Function of the Woman Extension Worker—(a) The County Agent

By Miss Agnes E. Harris

In the 15 Southern States, 60,000 girls and 30,000 women now receive instruction under the supervision of 462 women county agents.

The woman county agent has been the important factor in home economics extension work in the South. As the funds which were available for this work have increased, the county agents have been better trained and their tenures lengthened. State specialists have been used, thus decidedly increasing the efficiency of the work. The best results, however, have been secured as a result of concentrating upon the development of the county organization, with the woman county agent as the leader, and of employing as many state workers as are necessary to assist her in carrying on her work.

The women county agents organize the girls and women into clubs and instruct them in gardening, poultry raising, home making and the manufacture of fruit and vegetable products for home use. Work for the sake of service and work for the purpose of production are thus combined.

Our chief, Bradford Knapp says: "There is a striking difference between the rural home and the town home. The rural home is a part, and a very important part, of the organized effort to produce wealth, that is to produce things which can be sold or exchanged for money. The country home is a necessary part of the farm, whereas the town home is not a necessary part of the business in which those who live in the home are engaged."

The home demonstration work of the South has been planned to meet the needs of the women and girls of the southern country homes and "to give the women upon the farms a real business of their own, which in many cases elevates them from the drudge to a real partner in the whole farm undertaking."

Girls' Work

Home demonstration work as carried on in the Southern States includes work with both girls and women. Girls from 10 to 18 years of age are taught simple agriculture and home economics, and inspired with a love for gardening, canning and home making. Their interest in country life is thus augmented. The woman county agent explains the work to the girls in school, and leaves membership cards. If a girl wishes to join, she and her parents sign a card and send it to the county agent. Girls in a school or community are organized into a club which chooses it own officers and hold regular meetings. The woman county agent keeps in close touch with the clubs and the school teachers assist in the conduct of their meetings.

The work done by the girls exhibits many phases. Among these may be mentioned:

1. Agricultural. This project is based on the production and use of vegetables. Each girl selects a tenth-acre garden. First-year girls plant

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entire tenth-acres in tomatoes; second and third year girls start perennial gardens of small fruits or vegetables; while fourth-year girls select some special product with which they have made a reputation. With the tenth-acre as a working basis, the girls secure considerable practical instruction along agricultural lines. Records are kept and credit is given for all the products of the tenth-acre for the year. The gardens of our club girls furnish fresh vegetables throughout the year. The clubs meet for study from 8 to 32 times annually and the public schools now give credit for this work.

2. Home economics.

a. Canning for home use and market. The first-year girls can tomatoes, put up soup mixtures, purees, etc.; and the second-year girls can their vegetables and fruits.

b. The study of the food values of vegetables and of their preparation for the table is made a prominent feature of club meetings.

c. The construction and use of the fireless cooker in preparing cereals, soups, pilaus, etc.; and the construction and use of other household conveniences.

d. The study of bread making. Some clubs own bread mixers which are taken home and used by the members. As a result, several families have procured bread mixers and, consequently, make better bread.

e. Sewing. The most practical sewing lessons are those in which the girls are taught to make the holders and towels needed in their canning operations, as well as the club uniforms, which consist of a pink or blue chambray dress, cap, and apron bearing the uniform emblems. It is most interesting to note how the standard of dress in the country districts, from which these club girls come, is favorably affected by the influence of the simple, plain uniform costume of the club girl; how not only skill in sewing has been emphasized but an example set as to the proper kind of clothing. At one Floridian contest, a simple, well selected outfit including underclothes, shoes and dress to be worn by a fifteen-year old girl, was on exhibition. It was carefully studied during the entire short course and was given as a prize to one of the successful contestants.

3. Educational. At least three phases of the work are strictly educational in character and bear a close relationship to school work. These are:

a. Account keeping. A record book is given to each club member at the opening of the crop-year. She keeps a close record of all the work which is done, of the expenses incurred in producing the crop, in buying the cans, in harvesting, marketing, etc. These records improve from year to year, thus indicating the importance of this phase of the work.

b. Essay writing. To the written essay, dealing with the year's work, is accorded twenty percent of the total score which determines the location of prizes. Some of the girls commence to write their essays a year before the contest occurs. Their interest in composition writing is sharpened and the grade of their English work is materially improved.

c. Agricultural and home economics literature. The girls, their parents, brothers and sisters tend to form the reading habit. Books, newspapers, federal and state bulletins, dealing with agriculture and home economics, are more appreciated than is ordinarily the case.

4. Social. Community gatherings are held and home demonstrations are given. The people of the whole countryside are brought together at

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these club meetings, singing, playing of games and manifesting a most excellent community spirit.

5. Short courses.

a. The county short course. No feature of this work is more valuable than the county short course. The leading club girls from all parts of the county come together for three or four days study in the county high school. We have had 20 such courses this year, with an attendance of 534 girls. The women's clubs, church and school societies entertained the club girls in their homes, the schools lend the use of their laboratories, teachers, and auditoriums, the boards of trade their offices and rooms, and they usually give a banquet for the club girls and corn club boys who join them on the last day for the annual contest, or a dinner for the country visitors on contest day. The faculty of these short courses usually consists of the county, district and state home demonstration agents, the state poultry agent, the district nurse, and from the town, members of the high school faculty, the leading doctor and dentist. Demonstrations, laboratory work, talks and instructive visits, make the visit to the short course of great value to the club girl.

b. The state short course. The winner of the first prize in each county attends the state short course, all her expenses being paid. Sixty-nine girls attended the short course and 33 will attend one this year for two weeks. Girls who have attended these state short courses say that they have acquired:

1. A keen desire to return to or to enter college.
2. An increased interest in school work at home.
3. A marked improvement in their abilities along home-making lines.
4. An increased interest in club work.

When the work with girls was first organized, high yields and profits were emphasized; but as it has advanced, it has been found that it were better that many girls learn simple gardening operations than that a few girls should make extraordinary high profits. Hence, the plan of work has been changed. The women and girls are now organized into clubs and follow definite courses of study. These girls' clubs, meeting regularly under the supervision of the woman county agent, have resulted in:

1. The introduction of definite improvements into thousands of homes.
2. An increased attendance of girls at the colleges and high schools.
3. An increased interest in home-making.
4. The improvement of poorly selected and insufficient dietaries in many Floridian homes.
5. A marked increase in the quantity and quality of home canning and preserving.

Concerning this last item it may be said that the work of the woman county agent has lead many families to can and preserve for home use and for market where none canned before. Thousands of families now possess their own canning machines and are utilizing surplus fruits and vegetables. An interest in canning, preserving and the making of jelly is a natural outgrowth of this work. Not only has the output of canned goods been greatly increased both in home and factory, but new and more accurate recipes have been developed. Scientific methods are now being used by our housewives. Thermometers have been bought in great numbers. The term "pectin" is now in common use and its meaning and applicability are ap-

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preciated. Better products are put up in better containers. Jellies are made from the white portion of the orange peel, marmalades from the sour and bitter oranges, paste and jellies from the guava; these are a few examples of the products developed as a result of this work. The reports of club members indicate that they have put up $55,000 worth of such products, during the past four years. Indeed, expanding for a moment to the entire South, we may say that "There were 14,810 girls (in 15 Southern States) who reported (in 1915) a yield of 5,023,305 pounds of tomatoes, 1,262,953 pounds of other vegetables and fruits with a total of 903,562 containers packed, and an average profit of $24 per tenth-acre. More than 9,000 girls did work in poultry clubs and 3,000 undertook bread demonstrations."

WOMEN'S WORK

The results which were obtained with the girls created such great interest that a demand arose from the women; and this demand has been met by means of home demonstration work. The women county agents give individual instruction by means of home demonstrations in butter-making, care of eggs, poultry raising, selection of proper food for the family, in making some home improvement, such as the installation of an inexpensive water system, or screening of porches. Following successful home demonstrations, club meetings have naturally developed. These women's clubs meet under the supervision of the woman county agent. They adopt constitutions and by-laws which they are at liberty to change, keep rolls and records, and hold regular meetings. In some states, for example South Carolina and Virgina, monthly lesson sheets are furnished by the central office, and all the clubs over the entire State study the same lesson each month. In Florida, however, each club appoints a committee, which, with the woman county agent, selects the topics to be studied, plans the program for each meeting, and assigns topics. Definite home courses are being carried on by these clubs. At Homestead, Florida, a circle organized last year, with a home economics graduate as leader, canned cull tomatoes from a packing house, putting up 200 cans per member at a cost of 2½ cents per can. It holds monthly meetings and plans to plant an acre of tomatoes for its own canning. Such interest has been aroused that a second circle has been formed in the same community. A Polk county club is taking a correspondence course in home economics. A club, 250 miles from the State College, plans to send five representatives to its annual short course for housekeepers.

A report made this fall by a Leon county club member is typical of the spirit manifested by these club women. It reads:

"Following my graduation from a southern normal school, I taught two years and then married a widower and undertook the burdens of farm home-making for his family. For 15 years, uninterested and unhappily, I carried on the necessary work of the farm home which seemed drudgery. Since I have worked in the home demonstration club, attended the short course for home-makers, I am making a study of my home, improving the conditions and now I am intensely interested in home-making."

The women in their clubs study, under the close supervision of the county agents representing our home economics department:

1. The raising of poultry.
2. The sale of eggs.

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3. The manufacture of jelly, preserves, etc.

4. The canning of fruits and vegetables for market and for home consumption.

5. The construction and management of fall and winter gardens.

6. Nutrition, home managament, household sanitation and clothing.

Furthermore, the women are installing inexpensive water systems, making household conveniences of various kinds, rearranging the kitchens for greater efficiency in home work, and studying better methods of homemaking.

The first reports of definite home demonstration work from the women of the 15 Southern States, have come since 1915, and are most conservative. Three hundred and sixty-eight county agents last year reported that they enrolled 6,871 women, gave 3,379 demonstrations, with a total attendance of 74,335, and organized 250 rural community clubs. The women demonstrators reported that they had made 2,181 fireless cookers, 599 iceless refrigerators, 101 wheel trays, 1,423 fly traps, screened 661 homes, installed 124 water works systems and had 138 sanitary closets built.

THE COUNTY AGENT

Since the woman county agent work was introduced in Florida in 1912, 40 counties have been organized and 33 of these are in this year's organization. During this time 80 different county agents have been employed. Of the 47 who are not now at work with us, 20 have married; a few have become students; a few classroom teachers, having found the necessarily varied work irksome, have returned to their classrooms; and others for various reasons have been unable to continue. The 33 woman county agents now at work are under the supervision of two district agents, a state poultry club leader, and a state home demonstration agent, who is also director of the home economics department of the Florida State College for Women. The cooperative agency is the county board of education, and the work is carried on under its supervision. The women receive an average salary of $100 per month and are employed for an average term of nine months. Twenty are graduates of colleges or normal schools, nine have taken short courses in home economics, four have state life certificates for teaching and have specially prepared for their work. Twenty of these agents use their own automobiles. Two county boards furnish and pay the running expenses and up-keep of a car.

In view of the fact that the success of this line of work is largely if not wholly dependent upon the personality, training, tact and enthusiasm of the woman county agent who is chosen, the following statement, in which the three distinct types which have been met in our work are set forth, seems pertinent.

The first type is the pioneer woman who introduced this work into Florida.

None of these women are on our present staff. They are usually married women, strong in leadership, with years of practical experience, a keen sympathy with women and children, and a great desire to be of service. We found women for this work who either did not have a home to manage, or else could leave their homes in the care of someone. We gathered them together at the College and the University, and gave them instructions in the simple lessons necessary to introduce the work. It was

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not necessary to have trained leaders in the beginning. We could teach only a few simple facts in home economics and agriculture to a great number of people in the country. We were interested in getting a great number to do one thing well. That the simple process of canning vegetables in tin was chosen, was particularly wise, because of the simplicity of the process and because it furnished a means for making a profit easily. These pioneer women mastered this process in a short time, then went into hundreds of homes and instructed the people. These same people who became interested through the work of these agents, have organized the permanent clubs which are now systematically studying home economics.

The second type is the strong efficient woman who has successfully taught country and town schools in the county in which she is given the home demonstration work. This woman, as a rule, is devoted to her county, has unbreakable ties there, and has a great ambition to accomplish much for her county. The people know her and she knows the people. She organizes well. She has been accustomed to study. Short courses, summer schools and annual meetings give her an opportunity for more study and greater knowledge than the home-makers of her county can have. She can lead; she knows methods of teaching; she also sympathizes keenly, and inspires great love for the work among her girls and women. She knows the county educators and she gets the entire educational force behind her work. The county agents of this type have been thus far most successful. They have secured greater interest and enthusiasm among the girls and women. More girls have been better educated, more homes show definite improvement, more study clubs are organized under their leadership. A woman of this type is far more likely to succeed than the home economics graduate with no experience.

The third type is a graduate of a college or normal school who has made a special study of home economics. She of course is ideal if she has the following characteristics: 1. A love of and belief in home demonstration work as a factor in improving country life and adding to the happiness of farm home life. A teacher may sometimes successfully do class-room and laboratory work when she is not deeply interested, but I have never seen a county agent attain any degree of success, unless she believes in her work, unless she loves it, and unless she is willing to make sacrifices for it. 2. Experience in handling people and in organization. 3. Ability as a leader. 4. Creative ability. There is little precedent for a county agent to follow. There are unforeseen conditions in practically every day's work. No book or other person can be of assistance. Unless the county agent can take hold of unexpected situations and plan work to fit conditions, she loses many valuable opportunities of getting results. 5. Both moral and physical bravery. She is able to carry through any project she believes in and is unafraid to travel through the country, running her own automobile and ready to meet the emergencies that may arise on the road.

It is as necessary to increase the health, happiness and thrift of the women in the farm home as to increase the productiveness of the farm. The home demonstration county agent, sent to the home from the state college with the home economics extension faculty immediately behind her, is a prime factor. The country women who are availing themselves of this chance to study are making very definite and effective improvements in their homes.

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This work has succeeded because the county agent spends all of her time and thought on the women in her county. She paves the way, plans meetings and assists the state workers; but she follows up the work of the women in the homes and assists them in carrying out the instructions of the home economics specialists.

THE CHAIRMAN. Miss Alma L. Garvin of Indiana will discuss the work of "The State Delegate at Large."

THE FUNCTION OF THE WOMAN EXTENSION WORKER—(*b*) THE STATE DELEGATE AT LARGE

BY MISS ALMA L. GARVIN

The extension work for the women has certainly taken great strides since all authorities and all people are believing that the success of the farm lies in having a good home back of it. We can have nothing unless we have a good home, because the profession of home making is back of everything. Consequently we have taken greater interest in developing the profession of homemaking.

The aim of our home extension work is to arouse the women to an interest in better homemaking and better housekeeping, to arouse them to the point of thinking for themselves, and of wanting to help themselves, not to uplift them but to lead them to want to do better things and cherish higher ideals.

It has been said that the first thing that we need to do in extension work is to seek to increase the net income of the farm, for then more money will be available to spend in the farm home. It is not always the man's fault that there is not more money spent in the home. The women are prone to think that it matters little how much time it takes them to do their work and how much energy they need to spend in doing their work; just as long as the husband has enough money to buy new things on the farm, the wife seems perfectly satisfied, or at least feels that the money is needed to be spent could not be spent upon the home. She does not realize that her work is professional, and that there are methods which will enable her to have the work done in the easiest possible manner in doors as well as out of doors.

I remember going into an Indiana farm house in a good farming district. The husband was called a progressive farmer and had been on the farm for ten years. It was well stocked with tools. The wife found that of the money which they had spent on the premises during ten years, eighty cents had been spent on the farm and twenty cents for the home. Twenty cents is a very small half of one dollar.

The woman must grasp the idea that she must have more conveniences and better methods of doing her work; and therein lies the part that the state delegate at large can do. It is her place to interest the women in this new work and in using as many efficiency methods as possible.

A comparatively new and effective phase of the work is the home visitation. This deals with the individual problems. Whenever the delegate at large goes into the individual homes, she can find out exactly what the needs are. The women can be made to see how their work can be changed to advantage, their kitchens made more convenient at small outlay, etc. A woman often wants better things but does not know how to

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go to work to get them, but the delegate at large often sees what to do more clearly than does the person living in the house all day long. She can help her, perhaps, by moving one or two articles of furniture to make a more truly efficient kitchen out of one that seemed impossible. Through home visitation work the people can be organized into classes and clubs so that forces may be put at work to better conditions even after the extension worker has gone.

The home tours work well. We select various homes in the county that have good things, a well arranged kitchen, an attractive dooryard, a fine vegetable garden, an exceptionally pleasant living room, things that almost every home in the county could have. We enlist two or three workers from the outside who help in conducting these tours. People assemble at a certain point and go by auto or by team. Four or five stops are made during the day. The tourists nearly always stay until the very end. The numbers always increase during the day until, at the last stop, quite a group has assembled. Such a home demonstration in the home county is more effective than having somebody tell about conditions elsewhere. The women feel that if their neighbors can have these things they can have them also. We thus strive to interest people in having better things, in beautiful landscape gardening, more water systems, more heating plants, better wall coverings, better home decorations, better kitchen equipments, better kitchen arrangements, so that the homemaker may have time for other things than mere housework drudgery.

Publications are helpful, both state and federal. It would help a great deal if some unification of publications could be brought about, one state working on one subject and another state on another. Then there would be less duplication. The state delegate, being out among the people and knowing the needs of the community, oftentimes understands better how to present these things than do those who stay at home on the college campus.

The most effective way we have of reaching the people is through the woman county agent, who is located in the county all the time to help direct the working forces. She knows, or should know, better than any outsider can know how the people in her own locality live, what are their ideals, and how they can be inspired, and she can do more by personal help than can anybody else.

The farm woman needs more time than she now has for recreation and self-development. Too often she works from morning to evening and more. She has but little time to spend with her family or with the community. Many farm women have but little chance to be out-of-doors with nature, and really know but little of the beauties of country life. They spend their days in drudgery. We need to impress upon them that work is not all of life; that in order to be good homemakers they must have outside interests; they must have some time for reading. In a great many homes we find but one or two books, perhaps the Bible and the story-book of the Bible. We find no newspapers, nothing to broaden them out, to show them what others are thinking about. They live within themselves. We want to do what we can to give them some sense of the higher life. This can be secured to some extent by organization, by home economics classes, by girls' clubs and the like. These home economics classes are a decided help in unifying the community. Many community organizations are related to a church or a lodge, and people who do not belong to that particular church or lodge feel that they can take no part in these com-

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munity gatherings. This, of course, is a mistaken notion. The home is the unit in these home economics classes. Everyone can and does come in and work in such an organization. The communities where these home economics classes are organized are the strongest we have and are doing the most good.

The home economics class of 50 women in a southern Indiana town of 800 people secured the erection of a consolidated school. Their former schoolhouse had been condemned for years, but the town did nothing until this women's club took up the matter. The women "put it over" and put it up. It is a large building with an auditorium seating 900 people. That schoolhouse is going to be the social center for that town. It has a gymnasium, a manual training room, an agricultural room, two home economics rooms, and everything that a modern schoolhouse should have. This club, with the help of other organizations, has secured a Carnegie Library when there was no library. And in other ways it is a force for rural righteousness.

The delegate at large has a much wider field than has the county agent. If but little money is available for home economics extension work it should be placed in her hands, because with her commission she is able to make that money go further and can reach more people. If ample funds are available, the ideal condition would be to have a woman county agent in each county to direct helpful working forces, their supervision being entrusted to the state delegate at large in the interests of the greatest efficiency.

Miss Martha Van Rensselaer of New York. It has been proposed in New York, subject to adoption in the counties, that there shall be within the county a farm bureau association consisting of an agricultural department and a home economics department; that the agricultural department shall be made up of persons in the county who are interested in agriculture, and that the home economics department shall be made up of women and possibly men who are interested in home economics; that each shall have an executive committee of seven; that the 14 shall make a general executive committee from whose number a president and treasurer and secretary shall be elected; and that that general executive committee shall take care of the entire interests of the organization. This scheme may or may not be adopted by a county as it elects.

Dean Russell queried whether the home economics workers could teach rural engineering, for example. Is not this easily taken care of by interdepartmental courtesies? We hardly expect that a home economics worker would represent a department of rural engineering, or would deal with questions of poultry raising, dairy husbandry or horticulture. If a horticulturist cared to speak upon the care and feeding of children, he naturally does it through the courtesy and with the understanding of the department of home economics.

I believe in anybody teaching any subject who can do it well, whether that person is a man or a woman. It is not a question of sex but of preparation. We must remember that much of this subject-matter which applies to the household has been evolved and worked out by men in various laboratories—physiological, bacteriological, chemical and the like. However, home economics extension teachers are quite apt to keep within their spheres because of inter-departmental courtesies.

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THE CHAIRMAN. I imagine that Dean Russell probably had in mind the plan of a unit organization for extension work rather than a dual organization for extension work; that he wanted to indicate that the dual organization would necessitate duplication in certain departments where the work overlapped, as in the cases cited.

MISS VAN RENSSELAER. I do not believe in dual organizations. We are all working under a dean or a director of extension. There is a dual organization—perhaps you might so construe it—in that we each follow our own subject-matter; but we cooperate, one department with another, and we have a business organization which is not a dual organization but a unit.

MISS VIRGINIA P. MOORE of Tennessee. We have found that it is an ideal arrangement to have a man and his wife as county agents, or a woman county agent who is the wife of the county superintendent of education. We have found, furthermore, that some women county agents can run their own houses and do county work at the same time. However, a woman must possess rare executive ability to do both successfully. A woman who is acquainted at first hand with the problems she is teaching is on that account more effective.

A DELEGATE. What percentage of our counties is served by women county agents?

BRADFORD KNAPP. There are between 2,800 and 3,000 agricultural counties in the United States. About 1,300 agricultural counties are located in the South, 462 of which now have women county agents. I believe there are 17 women county agents in nine Northern States where this work is just being introduced. In the 15 Southern States their work is directly supervised by women district supervisors.

MISS FLORENCE E. WARD of Washington, D. C. In each of the Northern and Western States where regular home demonstration agents (women county agents) are being employed on a cooperative basis with the Department of Agriculture, these workers are under the direct supervision of a state leader of home demonstration agents who has general charge of the woman's work in counties thus organized. She stands practically coordinate with the state leader of men county agents in her relation to the extension director. Her work is primarily that of organization within the field of women's work. She confers with the home economics department of the college on all points involving subject matter and methods of teaching and refers matters of general organization affecting all groups (men, women and children) to the state leader of men county agents.

The work within the county is planned on a similar basis. The home demonstration agent who is responsible to the state leader of home demonstration agents works cooperatively with the man county agent and on an equal footing with him so far as her professional service to the county is concerned, but refers all matters of general office administration and county work organization to the county agent as the head of the extension activities in his county. In other words, the same plan that is in vogue with reference to the man county agent has been adopted for the organization of the woman's county agent work; and as in the South, a woman state leader of women county agents has been chosen save in those States where the organization has not yet been perfected.

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C. R. TITLOW of West Virginia. I am much interested in the thought brought out by previous speakers relative to the care of rural health and disease prevention. Has there been any extension service work along this line? Has it been found advisable to engage men who are as experienced and as well trained in medicine or nursing as are women to do this work; or do women only fit in here? Which of the two seems the more advisable?

MISS ELIZABETH KELLEY of Wisconsin. The woman who is working with us in Wisconsin is Dr. Dorothy Reed Mendenhall, a graduate of Johns Hopkins University in medicine, for ten years a practising physician, during three of which she was in charge of Dr. Holt's Baby Hospital in New York. She is eminently fitted to do this work. The fact that she is married and has children of her own carries conviction to the farm women. While this statement does not answer the question, it serves to emphasize the fact that I wish brought out, namely, that Dr. Mendenhall is not a nurse but a doctor; and this is the reason why we are using her as we do in this line of extension work. Her method is as follows: After the lecture in which she states very clearly her points, she holds a conference with those specially interested, at which there is a free discussion. It is from such conferences that this correspondence work arose. We have used men physicians but we found that the women were more reticent than they were with Dr. Mendenhall.

MISS ISABEL BEVIER of Illinois. "I am only asking for information because we have a nurse, not a physician, doing extension work, and the question comes whether we ought not rather to encourage these rural people to strengthen their boards of health and let the medical profession take care of public health work as such. It seems to me it is a fair question as to who, professionally, shall take care of the health of the community."

THE CHAIRMAN. This is a very pertinent question, and it is entitled to free discussion.

J. A. WILSON of Oklahoma. We employ a woman physician who holds the position of rural sanitationist. She has had 18 years' experience in the practice of her profession. She works under our state woman agent. She has created, in a little over a year, the greatest possible interest in means whereby the public health may be improved and maintained. Her husband is a practicing physician, and she is a very practical, hale and hearty, well-met woman, with children of her own. She does not try, in any sense, to practice her profession; she takes no fees. She is called in consultation frequently by the state and local boards of health and by local physicians who consider her work to be essential. The medical profession welcomes her help and cooperation for the reason that our physicians have so many contagious troubles and epidemics to deal with that they are getting tired of it in some sections. She works along preventive lines. She carries charts with her and she has got fly-traps made all over Oklahoma. The boys and girls are cooperating with her in trying to get rid of the house-fly and the mosquito. She has a great field of work which interferes with no one.

C. R. TITLOW of West Virgina. Will Miss Bevier state her question again? I did not understand her to imply that the extension worker was going into the sick room as a practicing physician.

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Miss Isabel Bevier. Following a lecture, does the extension worker for a greater or less length of time hold a clinic of personal service? I understand that this is done in some cases. I am not saying what is right or what is wrong. I am simply trying to find out where the line is to be drawn.

Miss Elizabeth Kelley of Wisconsin. In answer to Miss Bevier's question may I say that we might urge the same criticism against the work of the engineers or veterinarians? It also is professional. Are we going to prevent the country people from securing free advice from the engineer or the veterinarian?

D. J. Crosby of New York. We have made a beginning in New York along the line of cooperation with the State Department of Health through the farmers' institute service. One of the departmental district supervisors offered his services to the director of farmers' institutes, and will be scheduled in each institute held in his district. His talk or demonstration, whatever it may be, will be upon local health conditions, how the local physician sees the locality, the things that may be done there to improve health conditions, and the like.

This fear of interfering with the medical profession by the use of medical advisers or of people who discuss medical questions at our institutes or in our schools or in our extension work, is unwarranted. Some believe that we ought not to give instruction in veterinary science in our extension work, because it will interfere with the profession of the veterinarian. If we may use a parallel illustration, we ought not to give instruction concerning the care of the teeth, because it will interfere with the work of the dentists; but everybody knows that the more we talk about the care of the teeth, the more business the dentist has. We may well cooperate with existing agencies, like the boards of health, in carrying to the people this message concerning rural health.

The Chairman. Has this work been reduced to project form for submission to the Federal Department for its approval as a Smith-Lever project?

D. J. Crosby. It has nothing to do with the Smith-Lever activities. It is state farmers' institute work which is not tied up with Smith-Lever work.

Miss Isabel Bevier. I heartily approve of all the instruction in rural sanitation that we can get. I think anybody who has worked in the country at all knows that bringing home the need of sanitation to the people is one of our most difficult tasks. I still feel, however, that my question remains unanswered.

Miss A. L. Marlatt of Wisconsin. Dr. Mendenhall does not displace any physician. You must remember that she goes to the remote towns where very often the country woman is 50 miles from a physician. Out of the goodness of her heart, after she has done her educational work and tried to arouse interest in good sanitation, in good personal hygiene, and in what can be done by going to the towns where they can get in contact with a hospital or with good physicians, she does do personal service work; but she receives no pay for it whatever, and not enough compensation to

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pay for the nurse that she has to put in her own home to take charge of her children while she is away. While this is personal service work it is of the highest type of educational work, because she is working to arouse interest in rural nursing, in the need for better educated country physicians, for county hospitals, for a central county hospital where these women, living under pioneer conditions, can be helped.

BRADFORD KNAPP. The very pertinent question which Miss Bevier has asked ought to be answered and rather definitely. The question, as I understand it, is this: Is it legitimate for extension workers to do that which is a mere personal service with that object in view alone; or should they confine their attention to those matters which relate to educating the people to do the thing themselves?

The personal service element always enters into all kinds of extension work. A large amount must be done in order to get the lesson across; and it is often difficult to draw the line where the educational work ceases and the mere personal service begins.

I wish Mr. Crosby had carried his example a little further. We have, for example, this kind of a situation in county agent work: The county agent can make himself very busy and very useful as a sort of public-service agency. If hog cholera breaks out in his county, he can absolutely take over all the functions of the veterinary surgeons of his county, and treat hogs for the cholera free of charge. By doing so he may be performing a very excellent service to the individuals whose hogs he has treated, but he may be doing a very poor piece of extension work. As as extension worker he should take hold of the communities and organize them, get the veterinarians there to assist these people to treat their own hogs, or help organize the county for a clean-up campaign against the hog cholera, utilizing the services of these people who are trained in the doing of that work.

I believe, just as Miss Bevier has said, in this kind of work that teaches sanitation and prevention. As Miss Kelly has described the work, it may be entirely instructional work; but if it goes to the point of setting up at each of these places a clinic where the matter comes down to personal service in individual cases, then I do not believe that it is extension work.

D. J. CROSBY. There must be the demonstration of ability to do what you are talking about, or else your words do not carry confidence. The extension physician who talks about what she would do and what other people ought to do, and does not demonstrate her ability to give advice personally, will not get very far in having her lessons carried to the people. And this holds for all lines of extension work.

C. W. PUGSLEY of Nebraska (Chairman of committee on extension organization and policy). In accordance with arrangements made in former years the report of the committee on extension organization and policy will now be submitted to the members of this section in advance of its presentation before the general session.

The report of the committee on nominations was received and adopted. (See page 167).

THE CHAIRMAN. The section will now listen to the very important report of the association committee on extension organization and policy.

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(For report in final form see pages 134-139).

D. J. Crosby of New York. I move approval of the report and that it is the sense of this section that a reprint shall be made in sufficient numbers to supply extension workers.

(The motion was seconded).

The Chairman. Are there any remarks?

Fred Mutchler of Kentucky. I am not clear as to the five percent clause (Item 6). Is it meant that five percent of all extension funds should be held as a contingent fund?

C. W. Pugsley. Of course the Federal Department has nothing to say about funds other than Smith-Lever funds and those which are used as an offset. They have agreed to permit five percent of the Smith-Lever and offsetting funds to be set aside as a contingent fund for emergency projects, or for use on projects already in hand, at the discretion of the extension director—the total amount not to exceed $5,000 in any state.

Fred Mutchler. What is meant by the phrase "other subject-matter specialists"?

C. W. Pugsley. It was the contention of the committee that the States Relations Service as such had no excuse for employing its own subject-matter specialists for use among the people of any state to give instruction in soils, crops, or other subject-matter ordinarily taught in and by the colleges.

Bradford Knapp of Washington, D. C. (of States Relations Service). I am anxious that we should have the most hearty accord, and, therefore, I want to explain what I explained to the committee. The Department in its different subject-matter divisions has had specialists going to the States, but the States Relations Service, or at least my division of it, has been diligently working thoroughly to coordinate into the general plans any or all persons who go from the Department to the States; and, therefore, there will appear in the list that I sent to the 15 Southern States the names of certain persons listed as specialists responsible to subject-matter divisions of the Department for subject-matter. Their salaries are paid from those sources, but they are subject to the States Relations Service for their administration in the field and responsible to it for their conduct with the state divisions of extension. These persons are not intended to and do not take up the primary work of instruction of farmers. They do go to the States. For instance, the dairy specialist representing the United States Department of Agriculture comes in contact through the extension director with the state dairy extension worker, who, in most of the Southern States, already represents the dairy division of the Department of Agriculture and the dairy division of the State. These people will do no work within the State except by agreement with the director. Would this be considered a violation of the memorandum as now outlined by Director Pugsley?

C. W. Pugsley. The procedure as outlined by Mr. Knapp does not in any way violate the agreement as stated in this report. It states that subject-matter specialists will not be employed by the States Relations

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Service to do work among the people in any state except as agreed with the extension director.

BRADFORD KNAPP. You speak of uniformity of apportionment of funds among the States. I wonder if you have thought far enough to realize that that is a physical impossibility. For example, Congress may appropriate, as it has appropriated, money for work in the cane sugar area. How can such funds be equally distributed among the States? Other instances, such as work in the citrus sections, or for tick eradication, may be cited.

C. W. PUGSLEY. These are special matters and taken care of by the terms of the enactment appropriating the money.

W. D. HURD of Massachusetts (member of extension committee). A word of explanation further in relation to Director Mutchler's question regarding subject-matter specialists. This agreement represents the acceptance of the principle that the States Relations Service is an administrative body and not a teaching body. There seems to be some indication of a feeling on the part of certain directors that there were likely to be engaged in the States Relations Service a large number of subject-matter specialists who would be sent into the States to tell us what to teach and how to teach it. Now this agreement simply stipulates, as our committee understands it, that if the States Relations Service has money to put into the employment of subject-matter specialists, instead of engaging these men in and sending them out from the Washington office, the funds should be used through the agencies of the several States in cooperative projects for the purpose of employing men located at the colleges and working under the cooperative agreement.

FRED MUTCHLER. Concerning the clause stating that there shall be no communication between the States Relations Service and the State except through the director of extension (Item 1). Am I to understand that if, for example, a Kentucky farmer writes for information to the Federal Department his letter will be referred to my office for answer, or does this agreement deal solely with administrative affairs?

C. W. PUGSLEY. It deals with administrative affairs. In the preceding discussion we have agreed, I think, that the States Relations Service deals only with administrative affairs. Its subject-matter work is carried on by agreements with the various extension services.

BRADFORD KNAPP. The States Relations Service does not want to hold administrative communication with anybody except the director or through the director.

C. W. PUGSLEY. It is our opinion that the States Relations Service should hold no communication of any kind whatever with an extension subordinate except through the director, unless the director permits it.

FRED MUTCHLER. We all believe in that doctrine, but in order to prevent misunderstanding I believe we should carefully define the word "administrative."

C. R. TITLOW of West Virginia. We should be careful in our terminology. The word "all" as used in this report means more than administrative. The word "administrative" appears in our project in some such phraseology as "All administrative reports, orders, etc."

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C. W. PUGSLEY. The portion of the report now in question is worded as follows:

1. *Direct communication.* It was agreed that all work within the States should be done through the directors of extension and that there should be no communication between the States Relations Service and the workers within the States except as delegated by the directors; that, in brief, the principle of dealing directly with and through the extension directors enunciated in the general memorandum of understanding of 1914 should be adhered to.

BRADFORD KNAPP. It will be remembered, however, that I raised the question as to the meaning of the clause. As I understand it the States Relations Service agreed that it does not care to hold communications that vary policy or direct work or do anything of that sort with people except as they request information from the Department which does not in any way concern the handling of the work.

C. W. PUGSLEY. It is the contention of the committee on extension organization and policy that extension service subordinates have no right to approach the States Relations Service people concerning the organization and administration of their work unless the extension director allows them to do so.

G. I. CHRISTIE of Indiana (member of extension committee). That statement squares with my understanding. We are trying to carry out this plan. We consider it more important to establish the right relationships between the county agent, the extension director, and the States Relations Service than to get quick action on some matter which may seem of importance, as, for example, getting inoculation material for alfalfa. The procedure of Mr. Smith's office has been to send such requests back to our office, so that we may establish a procedure according to the rules. County agents as well as others communicate through the director's office. Otherwise we cannot properly direct the work.

M. S. MCDOWELL of Pennsylvania. That is the best possible way. It leaves no loop hole. Director Mutchler, for instance, is perfectly free to take up the matter and arrange it in any way that is satisfactory to him. His subordinates may write directly to Washington if he is willing, but not otherwise.

L. A. CLINTON of Washington, D. C. (of States Relations Service). There is now on my desk a letter from an extension worker to the Division of Publications asking that a certain number of publications be sent, and a reply acknowledging the receipt of the letter and saying that these publications were being sent. I asked the Division of Publications if the request came through the extension director, and found that there was nothing in the original correspondence to indicate that it had ever come through his office. I then advised the division to write to the extension director saying "We have a request from ———— for certain publications, and we are sending to you herewith the publications desired."

This episode shows how we are trying to handle little matters of that kind. But when a state extension worker writes to some subordinate in our office, sometimes the latter writes directly back. It seems to me that there are two sides to this question. Extension directors should look after

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their subordinates at the same time that the States Relations Service attempts to control its workers.

C. W. Pugsley. The mere fact that you sent the correspondence to which you allude directly to the extension director is a very wholesome indication of the departmental attitude. Furthermore, it helps the director to check up his workers. Otherwise he might not know of the infraction of this agreement. If you continue this policy of referring such matters to the director, no matter with whom they originate, difficulties will soon be ironed out.

Bradford Knapp. We have found extension directors themselves writing for departmental publications directly to the Department or to the Division of Publications. They are very apt to deal directly with departmental bureaus other than with the States Relations Service, and as long as they continue to do this, our work is greatly handicapped. I am in very substantial agreement with all that has been done, yet I feel that the language used is susceptible to so strict an interpretation that it might handicap the work. I do not imagine it will be thus construed, but it would be embarrassing to have a conversation with a county agent construed as a communication. We have worked hard to get matters so adjusted in the Department that this cooperative enterprise would work out as we all want it to work. All we seek is a square deal.

C. W. Pugsley. It has been said that extension directors often take up matters directly with departmental bureaus. They should not do so when the question in hand concerns matters that the States Relations Service has in charge. We should bear in mind that under the memorandum of understanding we are to have all our dealings with the Department of Agriculture concerning extension matters through the States Relations Service. It is as necessary for us as extension directors to hold our correspondence through the States Relations Service as it is for the States Relations Service to hold their correspondence through us. May I cite a specific case? Today I received a communication from a certain bureau of the Department of Agriculture reading something as follows: "We are sending you herewith five projects drawn up in accordance with the plan of the States Relations Service, and hope that you will sign and return them promptly." What that bureau should have done was to have submitted the project to the States Relations Service in order that they might be forwarded to us. As a matter of fact the States Relations Service had not seen the project, which contemplated a procedure which it does not countenance. It was obviously my duty to return these projects, either signed or with my comments, to the States Relations Service rather than to the bureau. As we have said in this report this work is not a one-sided affair. The extension directors have duties and face dangers as well as the States Relations Service.

J. F. Duggar of Alabama. We ought to be careful that the language of the agreement should not be so worded as to preclude extension representatives from direct dealing in a preliminary way with any departmental bureau. For example, we are in Washington today. Should we not be allowed the privilege of sounding some bureau official as to the feasibility of some contemplated plan? It seems to me that we might properly take preliminary steps through the bureau concerned and then, when matters

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are thoroughly in hand, take up the proposition with the States Relations Service.

Perhaps I do not appreciate all the difficulties that have led us to make such an expression as we seem about to commit ourselves to; but surely we ought to preserve two things, namely, freedom to deal directly in an unofficial way up to the point of consummation with the several departmental divisions, and freedom to render the greatest and most immediate possible service to our constituents. We must not let ourselves become so tied up with red tape as to prevent anyone doing anything that ought to be done immediately.

Of course, the last clause of the agreement reading, "except as agreed to by the extension director" is a saving clause. For example, an extension director might say that all matters of emergency, such as disease prevention, supplies, etc., might be attended to by the most direct line of communication, or that a county agent or district leader might get into immediate touch with departmental officials when he needs at once hog cholera serum, publications, etc.

THE CHAIRMAN. As I understand it this situation is met by the elastic clause which states that these agreements may be abrogated by arrangement between any extension director and the States Relations Service.

J. F. DUGGAR. May I ask the chairman of the committee whether he understands that an extension director might similarly abrogate that section, which, strictly construed, would prevent him from initiating introductory conversations with the several bureaus?

C. W. PUGSLEY. There is nothing in the agreement, even when strictly construed, which prevents introductory conversations. Introductory conversations are not administrative communications. Some such code as the one proposed by the committee must be adhered to if we expect to secure effective cooperation. If we deal directly with departmental officers without going through the States Relations Service, we must permit the States Relations Service and departmental workers in general to deal directly with our subordinates; in which case we had better revert to the system that was in vogue several years ago. What is sauce for the goose is sauce for the gander.

J. F. DUGGAR. Is there not a distinction to be made between the cases of the departmental men dealing with subordinate extension workers and of our own dealing as extension directors with departmental bureaus?

C. W. PUGSLEY. I think not. Under the general memorandum of understanding and under the law creating the States Relations Service, it is charged with the oversight of all the extension work of the Department. Likewise, I believe extension directors are charged with the oversight of all the extension work of their several States.

J. F. Duggar. The point I seek to make is that before the consummation of a project, it is not extension work. I want to get ready to do extension work in any way that seems to me most expedient; and then, when it comes to the making of actual contractual relations, I am ready to deal with the States Relations Service.

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C. W. PUGSLEY. The committee believes that in the working out of any project agreement it would be better for you to take with you a representative of the States Relations Service when you approach the departmental officers with whom you contemplate cooperative relations.

L. A. CLINTON. Here is a case in point to illustrate how the arrangement works out. A serious insect infection of wheat occurred in a state which had no entomological specialists. Instead of dealing directly with the Bureau of Entomology, the extension director telegraphed the States Relations Service. We took it up with the Bureau of Entomology and secured help that a letter of telegram sent directly never would have secured. We made a special case of it at once and got an immediate response.

C. W. PUGSLEY. I do not think we can too strongly emphasize the point just made by Mr. Clinton. Telegrams, letters, requests of all sorts should be sent to the States Relations Service and not to any departmental bureau or to individuals. If they are, better and quicker service will ordinarily be secured.

A. J. MEYER of Missouri. We had a similar experience in Missouri. We needed a man in a hurry to help in fruit packing demonstrations. We took it up through the States Relations Service and secured our man. We could not have secured him by direct communication.

FRED MUTCHLER. I favor the spirit of this proposal, but wish to go on record as opposed to its letter. I understand the chairman of the committee to say that preliminary arrangements may be held with departmental officials other than through the States Relations Service, but he does not seem to think it is wise. Did the committee prepare the questionnaire?

C. W. PUGSLEY. It originated with the committee on extension organization and policy and was issued at the request of several extension directors.

W. R. DODSON of Louisiana (member of extension committee). The desire of the committee has been to endeavor to prevent little things from marring the accomplishment of the great purposes wrapped up in this work. It has hoped to keep small sand particles out of the bearings lest a hot-box wreck the train. It hopes through this agreement to obviate misunderstanding. It believes that if all the departmental activities are directed through one channel, namely, the States Relations Service, and all the state extension activities are represented by the extension division of the college, friction will be avoided. It is straining at a gnat to read meanings into the language of this prepared agreement that are not plain, common sense interpretations.

D. J. CROSBY of New York. I should like with your permission to change the language of my motion. I move that the section express its approval of the report of the committee on extension organization and policy, and ask the committee to seek to secure from the Association sufficient reprints to supply all administrative extension officers.

With the consent of the second, the previous question was ordered and the motion, as amended, was passed.

THE CHAIRMAN. The committee on resolutions will now report.

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C. R. TITLOW. The committee offers two resolutions, as follows:

"Resolved, That the chairman of the committee on extension organization and policy shall serve ex-officio on the program committee of the section on extension work."

Whereas, there appears to be a lack of uniformity in the usage of the terms "demonstration" and "project," therefore:

Be it resolved, That the special committee on agricultural terminology be requested to define the terms and their application, to the end that all reports of extension work may be uniform and comparable.

On motion, the resolutions were adopted.

On motion, the section took a recess until Friday afternoon, November 17, at two o'clock.

AFTERNOON SESSION, FRIDAY, NOVEMBER 17, 1916

The section was called to order at 2 p. m. by the chairman, K. L. Hatch of Wisconsin.

THE CHAIRMAN. It has been indicated during this Convention that both the States Relations Service workers and the individual extension directors experienced difficulty in adjusting the details of project agreements. The wisdom of the adoption of a system whereby such difficulties may be obviated has been stressed. The proposed system necessitates the widest possible publicity and the fullest and frankest consideration. Personally, in Wisconsin, we have been most fortunate in our relations with the States Relations Service. We have had our minor difficulties but have found it possible satisfactorily to adjust them. We have realized from the beginning that there are two sides to every question and that each party should strive to understand the other's position, and, so far as may be, properly to adjust their differences.

Your chairman had this thought in mind in the shaping of this program. He knew that different opinions were held and various points of view were being expressed touching the project system. It is hoped that the persons who have been selected to take part in the discussion will frankly and fully present both sides.

The discussion will be opened by Director W. R. Dodson of Louisiana, who will consider "The Written Project System as Affecting Cooperative Relationships with the United States Department of Agriculture."

THE WRITTEN PROJECT SYSTEM (*a*) AS AFFECTING COOPERATIVE RELATIONSHIPS

BY W. R. DODSON

In considering the written project system, as one of the things that might influence cooperative relationships, we shall discuss two things that are of primary importance: First, the spirit in which the project is formulated and interpreted by the cooperating parties; second, the understanding of the parties concerned as to what is meant by cooperation.

The written project supposedly represents a description of a definite enterprise that is to be undertaken, including a statement of purpose, method of procedure, sources of funds for support, official relationship of cooperators, etc. This written expression may be formulated so as seemingly to be almost perfect, in stipulating the relations that are supposed to

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exist between the cooperating parties, and yet be interpreted so differently by the two parties as to give rise to a spirit of antagonism that may utimately prove fatal to any good that might otherwise be accomplished; or it may be so straight-laced and specific in detail as to prevent needed elasticity, and become galling to those who work under it, thus developing a feeling of resentment against what appears to be the attitude of exacting auditorship or approval on the part of administrative officials who demand rigid and literal adherence to the written agreement. On the other hand, the written statement may be ambiguous and incomplete, and even subject to severe criticism, if one were disposed to make a technical application of principles involved, and yet, because of the spirit in which both cooperating parties interpret it, work smoothly with the most beneficent results. Apprehension of the danger of setting bad precedents, of course, should be given some consideration, but it should not be allowed to reach a degree indicating distrust of either of the cooperating forces. I do not mean to underestimate the value of a clear and comprehensive statement of the project, for ordinarily the effort to make the statement clear would bring out any differences of understanding, and enable both parties to present their views for adjustment before the work is begun; but between the two extreme cases, it seems to me that a very imperfectly and incompletely written statement between two cooperating parties who understand and have faith in each other is preferable to a perfectly written stipulation of legal relationships that prevents outwardly expressed friction, because of this legal restraint. Sympathy in purpose is at the foundation of cooperation. The spirit in which we go at the work is sometimes largely influenced by our interpretation of cooperation.

Congress has not defined "cooperation" as used in the Smith-Lever Act. It seems to be taken for granted that the Secretary of Agriculture and other departmental officials and the college executives would be broad-minded, unselfish and patriotic enough to define between themselves what would constitute cooperation in the sense best calculated to accomplish the desired purposes, when it was stipulated that the work should be done in a manner agreed upon by them. The term ordinarily implies the idea of equality. There can hardly be cooperation in this sense in administration between a superior and an inferior official. Agreement likewise denotes the idea of equality. A superior and a subordinate would neither cooperate nor agree, though they might work together in perfect harmony, as long as they understand that their relations are defined as being those of superior and subordinate. On the other hand, if either party believes that he is superior and the other believes they are on terms of equality, harmony may become impossible. Especially is this true if one of them undertakes to demonstrate that he is the superior.

In the preparation of the project, therefore, the idea of relationships will have a material influence upon its formation as well as upon its execution. The language of the bill implies that the colleges shall assume the initiative in this work, when it stipulates that the work "may be inaugurated in connection with the college or colleges," etc. In Section 2, we find—"and this work shall be carried on in such manner as may be mutually agreed upon by the Secretary of Agriculture and the State Agricultural College or colleges receiving the benefits of this act." In Section 3, the Act in part provides that "plans for the work to be carried on under this Act shall be submitted by the proper officials of each college and

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approved by the Secretary of Agriculture." Sections 6 and 7 stipulate that the Secretary of Agriculture shall report to the Secretary of the Treasury and to Congress the expenditures of funds appropriated, the progress of the extension work, etc. The written project system is the best method that has been suggested for meeting these requirements. It was presented by the Executive Committee of the Association, and has been the basis of agreement between the Secretary of Agriculture and nearly all the States for carrying on extension work under the Smith-Lever Act. If the colleges approach this task of project formulation with a feeling of apprehension, whether it be justified or not, that the federal officials are disposed to restrict their legitimate fields of extension work, or to remove from them the privilege of initiation, or that they desire to build up within the Department a strong organization that shall dominate and control the policies of extension work in the States, or in any way deal unfairly with them by abridging their rights and privileges, it would be very hard to frame and execute a project that would meet the full measure of efficiency that is expected nor would it be likely to engender that happy and stimulating cordiality between the workers of the cooperative institutions which is so desirable.

Considering the matter from the other side, if the departmental officials approach the written project with a suspicion, justified or unjustified, that the colleges desire to hold the exclusive privilege of interpreting the Act, and of saying what the money shall be spent for, and that their disapproval as to the subject-matter or method of procedure will be resented by the colleges, cooperation in the proper spirit will also be impossible. It is not likely that Congress thought the college officers would be unwilling to confer or work in harmony with, and profit by the advice of, the federal officials, but that they could counsel and plan and work together as a unit.

I have assumed extreme cases because extremes serve best to illustrate a principle. As a matter of fact, college and departmental men alike should represent the highest development of unselfish and patriotic public service. Surely it is one of the functions of education so to broaden our sympathies and subdue our personal ambitions.

We can cite within our personal observation business men who have exhibited a practical working interpretation of cooperation and agreement. Two men become partners in an enterprise. Both are honest, both are able, one perhaps is stronger in some line, the other in another, thus balancing each other. They work together in confidence, patience, with forbearance in mistakes, and the bonds of friendship grow strong between them, because they trust and honor one another. This is the business man's idea of cooperation and agreement. They may enter into a written contract or agreement defining their responsibilities and their privileges, but the business of cooperation proceeds upon their mutual understanding gained from conference and the due deference each shows to the judgment of the other, the success of the business being always uppermost in their minds.

Congress might have stipulated conditions and have made rules and regulation for safeguarding the plans for prosecuting extension work, but the details were entrusted to the Secretary of Agriculture and the Agricultural Colleges. This confidence of itself emphasizes the responsibility placed upon those directing the work of these institutions. It is a work calling for broadmindedness of purpose and liberality of spirit.

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The Executive Committee of this Association justly enjoys its complete confidence. We are proud of it because of the eminence of its individual members in the fields of science and education, and because of what it has done in our interests. Probably no other group of men is so conversant with the development of the Smith-Lever Act, and with the spirit in which Congress interpreted its own purposes, as is this Committee. A discussion of the administration of this Act appears in the 1914 Proceedings of this Association (pages 111-129). It was a premeditated discussion, arranged for on the program. The chairman of the Executive Committee and Director A. C. True, representing the Secretary of Agriculture, as well as others took part. Reviewing these discussions, one is impressed with the idea that a full agreement was made as to the manner of cooperation between the colleges and the Federal Department, and the plan was generally endorsed with happy felicitations upon the auspicious inauguration of the Smith-Lever Act. The written project system is the classified elaboration of the way of carrying out the cooperative plans, and therefore must vitally affect the ultimate outcome.

It must be kept in mind that extension work is of great magnitude. It is new. It is different from any other work we have done. It is supported by large contributions of funds from a variety of sources. The distinction between and the separation of extension work, regulatory service, and other duties are difficult or sometimes impossible to accomplish. The organization for handling these activities is large and involves dealing with many men of different temperaments, both within the States and within the Department. If we are to prove worthy of the trust imposed upon us, we must maintain an attitude of patience towards seeming violations of the written agreement, in letter or in spirit, whether it is through thoughtlessness, ignorance, or premeditation. The rank and file of the men employed on both sides, are honest, sincere and trustworthy. Surely these men can maintain their onward progress in helpful cooperation, if all complaints are patiently and fairly considered and investigated without prejudice or favoritism, and disposed of without lingering bitterness.

I believe that the present basis of cooperation is such that every difficulty may be met through the written project system. I recently requested of Doctor True a statement of his interpretation of cooperation. On Saturday of last week he handed me the following memorandum which he had previously formulated:

COOPERATION

Department	*College*
Smith-Lever	
Suggestions for improvement of plans.	Initiation of plans.
(*a*) Subject matter.	(*a*) Subject matter.
(*b*) Methods.	(*b*) Methods.
Study of methods and results of extension work in all the States.	Administration of approved plans within the State.
Furnishing of information to the States.	Giving of information to Department.
(*a*) By personal conference.	(*a*) By personal conference.
(*b*) By correspondence.	(*b*) By correspondence and "reports."
(*c*) By publications.	(*c*) By publications.

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Use of department organization, personnel and funds to supplement work with funds from sources within the States, in accordance with memorandum of understanding.
Use of department frank.

Agreement to work under memorandum of understanding.

It would seem that this is a liberal interpretation and should be entirely satisfactory to the colleges. If projects are written and carried out in the spirit of this memorandum, the larger field of privilege is with the college.

So far as I know, the incidents that have marred the complete harmony and happy relations between the colleges and the Department, have been due to matters not completely under the control of the States Relations Service, and in some instances were evidently not understood by the Secretary, or were due to conditions within the States which are difficult to adjust. I believe the general relations today are better than they have ever been, and that during the past two years very material progress has been made towards putting into effect an organization that will soon bring all agricultural extension activities into relationships of the most hearty cooperation. The written project system, as now in effect, or as it may be modified in the light of experience, taken in connection with the interpretations of the memorandum of understanding as recently agreed upon, should largely prevent all future misunderstandings.

The members of the committee on extension organization and policy have had more opportunity to measure the temperament of the States Relations Service, in regard to the formation and the execution of these written projects, than would have been afforded them in considering only the projects of their own States. As a member of that committee, my personal impression has been that the States Relations Service people are making every reasonable effort to facilitate and perfect a basis of cooperation that will be fair and just to all concerned, and that they are looking at these matters in a broadminded way. They should be met with equal candor and breadth of comprehension by the college officials.

Patience, perseverance, trustfulness and candor must characterize our relationships in perfecting the machinery for this work of such tremendous magnitude. Probably no one piece of national legislation is destined to have greater influence on the American people than will the full development of the Smith-Lever Act. He who contributes to its most rapid and effective development is a benefactor to mankind. It would be unfortunate, in my judgment, if Congress found it necessary to pass any additional measures interpreting the Smith-Lever Act, made necessary by the contentions and disagreements arising in connection with its administration.

I believe that the matters that have to some extent marred the complete harmony between the colleges and the Federal Department are not of sufficient magnitude seriously to threaten the cordial relations which predominate, and which will become intensified with the better understanding that will result from candid, sincere discussion.

THE CHAIRMAN. Director A. J. Meyer of Missouri will continue the discussion on this subject.

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The Written Project System (a) as Affecting Cooperative Relationships

By A. J. Meyer

Under the present organization of our extension activities, there are two distinct and widely different types of so-called "cooperative" relationships existing between the United States Department of Agriculture and the several state colleges. In the one, the Federal Department and the States contribute equally, or at least mutually, to the support of the work involved. In the other, the State does all the work and pays all the bills. In Missouri we have one project covering a relationship of the first type and 15 covering relationships of the second type. It is needless for me to say that we regard the Smith-Lever federal money as a state fund, not only in name and by courtesy, but in fact and by law.

In order that we may differentiate between relationships established by the written project system and those established by law, I want to take just a minute to refer to the Smith-Lever Act. I need not quote any portion of it. We are all familiar with its provisions.

The Act is introduced as a measure providing for the carrying on of extension work in agriculture and home economics by the Agricultural Colleges of the several States "in cooperation with the United States Department of Agriculture." And that cooperation is to consist of what? The only relationship defined by the act is:—On the part of the United States Department of Agriculture approving the plan of work, auditing the accounts, reporting to Congress; on the part of the States, formulating the plan of work, doing the work, paying the salaries and expenses incident to it. How can we designate such a relationship as "cooperative" and retain our respect for that perfectly good, though much overworked, term, "cooperation?"

The Smith-Lever Act in operation today in Missouri is not the act itself but, rather, an array of superimposed interpretations. Stripped of these the State would be as free to work out its own extension problems under the Smith-Lever Act as it has been free these many years to work out its problems of research and investigation under the Hatch Act.

And right at this point, may I venture the prediction that the extension activities in the various states, hedged about and supervised and restricted by a small army of administrative officials here at Washington, will never exceed, if it ever equals, in efficiency, service to the people and economy of administration, the work of the experiment stations as a whole under the Hatch Act, with practically a free hand by the various States, following the masterful leadership of Doctor True and Doctor Allen with few assistants and clerks.

In its most simple application the Smith-Lever Act requires:

First, that each state, each year, formulate plans of work and present them to the Secretary of Agriculture for approval;

Second, that the Secretary of Agriculture sign these plans indicating his approval, if it appear that they provide for "the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities and imparting to such persons information on said subjects through field

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demonstrations, publications and otherwise," subject to the restrictions imposed by Section 5 of the Act; and

Third, that at the close of the year the Secretary of Agriculture audit the accounts and formulate a report to Congress.

Beyond this, the Smith-Lever Act requires nothing, but permits much. It is within the field of what the Smith-Lever Act permits, rather than what it requires, that the written project occupies a prominent place in defining relationships.

Within this field, three relationships merit more than passing comment, but for lack of time can be given only the briefest mention. The first of these relationships has reference to the

PROJECT PERSONNEL

The project form in general use requires that the name of the leader be given as well as the names of all other persons concerned with the project. A detailed statement of salaries is also required. Thus is established the principle that the workers in extension and the salary scale under which they work, regardless of whether such workers be jointly employed or not, are subject to the approval of, or disqualification by, the United States Department of Agriculture. In all of our Missouri projects, except one, the salaries and expenses of the workers are paid from state funds, their equipment is furnished from the same funds, they are housed in offices belonging to the State and are directed in their work by state-employed administrative officers. The Department contributes nothing to the support of these workers, according to the principle established by the written project, yet it must approve their appointment before their work can begin.

A second relationship is that of

METHODS IN EXTENSION

The written project, according to the form which I believe most of us are following, not only tells what work is contemplated, but is required to set forth in considerable detail just how the work is to be done. This relationship gives to the United States Department of Agriculture the right to sit in judgment, not only upon the work itself but upon the manner of its doing. Whatever our opinion of this relationship may be, we must concede that it is a fortunate one for states that need to be forcibly protected against their own incompetency.

Finally, the written project establishes a third important relationship,

THE BUDGET

Through the written project the States are asking the United States Department of Agriculture to approve their detailed budgets and the Department is vigorously accepting the responsibility. The only budget actually required by the Smith-Lever Act would read for Missouri for the fiscal year ending June 30, 1917:

Smith-Lever fund	$52,229 32
State offset	42,229 32
Total	$94,458 64

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The Act concerns itself only with totals. It does not define extension work in agriculture and home economics in terms of a budget. The amount which is expended on any project cannot be a factor in deciding whether the work proposed does, or does not, consist in "the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges" in accordance with the terms of the Smith-Lever Act. Any phase of extension work which may properly be financed with Smith-Lever funds or with state offsets, continues to be a proper charge regardless of whether much or little be expended.

To the best of my knowledge, the establishment of these relationships has worked no particular hardship in any of our states. As Director Dodson has well said, it is not of what is written into the projects nor what principles are established in the projects that really counts, but the spirit we put into the work.

We have named our appointees, outlined our plans of procedure and prepared our budgets—yes, and called for the inevitable readjustment at the close of the year—all without serious departmental interference. All the Department has asked is that the principles be maintained. This harmonious situation will continue so long as those parts of the written project which have to do with personnel, the method of work and the budget of work, are treated as so much blank paper, or as merely conveying information for the enlightenment of the United States Department of Agriculture, and not as matters requiring the formal approval of the Secretary of Agriculture. The "rub" will come should the Department accept the written project at its actual face value, and, under its mutually approved terms, assume authority in the naming of state employees, in dictating methods of doing work and in deciding upon the distribution of funds between various lines of extension activity. The question arises: "Should anything be included in the written project other than the details which under the terms of the Smith-Lever Act require the formal approval of the Secretary of Agriculture, leaving the matter of information and minor details to reports and instruction sheets, rather than to a formal project?" I merely raise the question. I do not seek to answer it.

Of course the State will want detailed projects and budgets as a part of its administrative machinery. In the minds of many of us, however, it is a question whether the Department has the right to pass upon these details, particularly in view of the fact that more details are being included in projects each year, and that projects are being split up more so as to make each budget a little item by itself.

All extension directors can appreciate that there are conditions under which departmental domination—I am not afraid to use the word—may be of assistance. When, for example, a college becomes involved in politics of the peanut type, it is a fine thing to have the "Great Father at Washington"—as one of our members puts it—step in and administer things. Then, too, I have it from one of the department men who ought to know, that sometimes collegiate administrative spectacles get so badly out of adjustment that they fail to reveal the line of demarcation between investigation and extension, or—which is even a finer point—between extension and Smith-Lever extension—two types that most of us have come to recognize.

On the other hand, not a few of our college people feel that in their zeal to keep extension funds from contamination by too close association with, or even proximity to, investigational work, the extension divisions,

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under the cooperative influence of the United States Department of Agriculture, are leaving a gap between the point at which investigation ceases and the extending process begins. Whatever may be the merits of the countercharge, it would appear that an outside referee might be of service in helping discover the bounds of investigation and Smith-Lever extension.

So, after all, is it not possible that the written project, establishing as it does the principle of departmental dominance in intra-state affairs, may prove to be a life insurance policy on the extension work in some of the States all of the time and all of the States some of the time?

THE CHAIRMAN. Mr. Bradford Knapp of the States Relations Service will continue the discussion in its relation to county agent work.

THE WRITTEN PROJECT SYSTEM (*b*) AS AFFECTING THE WORK OF COUNTY AGENTS

BY BRADFORD KNAPP

What do we mean by a written project? In reality we mean a plan of work or a written statement of what the county agent proposes to do in a county, and how the work is to be done. It is in the nature of a record of what the parties contemplate shall be undertaken, the field to be covered, the problems to be attacked, the method of procedure, the cooperation, and any other details including a possible history of past experiences necessary to complete in full an understanding of the work outlined for the county.

As far as the county agent is concerned, it is of great importance that he either have or rapidly develop a plan of work or project which may include a large number of individual projects. The county agent who proceeds in his county without duly considering the problems of the people and making out a written plan by which he is going to endeavor to teach or educate these people to surmount their own difficulties and solve their problems, is not taking due care in the administrative carrying on of his work.

Who is to make out the plan of work? The project or plan of work of the county agent, as I see it, is made up of the thought and purpose of many persons who are interested in what he is going to undertake to do in the county. The county agent is a representative of the extension service permanently located in the county, and as such is bound to impart to its rural population such important information as the college of agriculture, state experiment station and the United States Department of Agriculture possess which may be useful in the solution of the local problems of the people. He must render such effective service to this end as may be outlined in the written plan of work. It follows that the college of agriculture, and especially the director of extension work, is an interested party in the formulation of this project or plan for the county. On the other hand, the plan should not be prepared without consultation with the people themselves in the several communities, for after all they are the ones chiefly interested in and to be benefited by whatever plan may be adopted.

There have been statements made during the last few years at many of these conferences, taking extreme views regarding the origin of the plan of work; some holding to the opinion that the extension workers not only should plan but execute the work to be pursued in a given community; others holding to the opposite opinion, that the people themselves in a community

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should entirely control the work and make their own plan or project. Neither of these views is entirely correct. We should utilize the thought of both ends of the line and all the intermediate points of contact. The final plan should be the result of conferences between the community organizations of farmers and others interested in the agricultural and economic progress of the county, and the representatives of the extension service. The people know their problems and their own desires, but they do not know what information the extension service may have to impart, and therefore the best thought that can be brought to bear upon the problem, both from without and within the community, should be drawn upon, and especially should this include an intelligent study of the situation on the part of the extension forces as a whole.

For example, in some sections of the country a farm-management survey would accurately analyze the situation and disclose the successful type of farming as contrasted with the unsuccessful type. In such communities the natural tendency of the farmers, who are free to choose the type of farming they desire to follow, is to choose the most profitable type, and, therefore, the most profitable type, as disclosed by the survey, constitutes a safe guide to others of the community. But there are other sections of the country where this has not proven true. In such sections there are economic factors which must be considered. The farmers may not have been free to choose the best type of farming. Such regions need outside thought and outside assistance, not only in the solution of their problems but in taking up the right type of extension work in the community to disclose the needs of the people. These needs often involve a very intricate relationship existing between farming, marketing, transportation, tenantry, farm ownership and rural finance. There are regions where even the most profitable system of farming, as disclosed by the survey, will not prove the safest in the long run. Such regions need the steadying influence and careful demonstration of safer systems of farm management.

In the county agents' work we ought to get right down to the community. I believe in the organization of communities of rural people as the next most important step in American agriculture. I like to see the community taken hold of and brought to think about its problems, and to organize the people to help in the solution of these problems. In quite a number of the States the plans of work are being first taken up in community organizations. These community organizations are formed in from 10 to 20 neighborhoods in the county. At these meetings the people are stimulated earnestly to think about the work which is to be done for the next year. The county agent lays before them such suggestions as he may desire to make. In the States I have referred to, one of the principal features of the county projects is actual demonstration conducted by farmers. In these communities the people often elect a number of their members who shall demonstrate improved methods of agriculture for the benefit of the rest of the community. By these demonstrations, I mean the actual putting into practice of methods advocated by the county agent, by the farmer or some member of his family on the farm or in the home, and used as an object lesson for the rest of the community, thus teaching by example rather than by precept. The results are to be judged after all by the number of people who adopt better methods and not by the number who attend meetings or manifest some other casual interest in agricultural work.

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The main thing is to find out the true problem of the community. It may be a problem of soil fertility, of farm management, or of a more self-supporting system of farming. Time forbids our elaborating upon the variations of the problems of the community, but the problems must be determined and some work should be done which will show the people a solution of these problems and point a way to better agriculture and to better rural life. In the South we are firm believers in the community organization of farmers, such as I have described. The county organization, or, as we have often termed it, the county council of agriculture, consists of delegates elected by the several communities meeting with the county agent and other representatives of the forces interested in the agriculture of the county. Each community representative brings with him the plan of work or project of his community. At the county meeting these are combined into a plan of work or project for the entire county. I have endeavored to describe, in this brief way, how county projects of work can best be secured.

But you will say: "What about specialists and specialists' projects?" I will endeavor to describe how the work of specialists is woven into the county project. A specialist is one appointed under a project to carry on work in some particular line of agriculture with the whole State as his field of operation. If he understands the county agent system properly, he will plan definite lines of work to be illustrated by demonstrations conducted by farmers, for the purpose on his part is the conveying to the people the best information on the particular subject to which he is assigned. Of course, as a whole, his work is planned by himself and the director of extension, and involves numerous duties. I am speaking now particularly of his work in relation to county agents and the demonstrations to be conducted by farmers. When the plan of work suggested by the specialist has been properly revised by the director and other administrative officers at the institution, it is to be sent to the county agents.

When the county agent goes to the communities of his county to make up the plans of work for the next year, he has these specialists' plans in mind, and, by judicious suggestion to the people, he places in the county plan a sufficient number of demonstrations of the character outlined to illustrate the work contemplated by the specialist; thus these become a part of the county plan or project.

For example, a horticultural specialist, in one of the Southern States, took up a plan of a demonstration in an all-year-round home garden. This was one of the great needs of that territory. In his plan he outlined a home garden and its management from one end of the year to the other in such a way as to furnish vegetables for the family the largest possible number of days in the year. His written plans suggested five demonstrations of this character for each of a number of counties. He agreed to visit the county agents periodically, to furnish literature, and to assist the county agents in carrying out these specific demonstrations. The county agents agreed to procure or place the demonstrations upon five farms in the county. The farmers selected were to furnish the land, tools, and labor, and reap the benefits of the instructions which they were to carry out as directed by the county agent with the assistance of the specialist. These were to be examples for five communities in each county. I have used this example to illustrate my thought, and could easily multiply the number of illustrations if time permitted.

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The county agent's plan or project of work for the year should be flexible. Whoever finally approves the county agent's plan of work must have constantly before his mind the problem of its balance. It is a plan for the year. The county agent should not be permitted to overload so that the extraordinary duties which may, from time to time, be thrown upon him, cannot be assumed. It should be remembered that the people will call upon the county agent for many things which cannot be written into a project, and due consideration must be given to that fact in shaping his work for the year. The main features of the plan should continue through the year, but time must be allowed for extra duties and the incidental changes which may be made necessary during the progress of the work.

Sometimes the county problem is more than the mere problem of the farm. There are regions where extension work must go beyond the farmer, and educate those who, though not farmers, are nevertheless the most potent factors in shaping the agriculture of the county. I know of a county in a certain state where the county agent has felt for some time that he was not accomplishing a great deal. The vast majority of farmers in his county are tenants. Their one crop is tobacco. Now a tenant is not interested in soil improvement, live stock, legumes, or in many other things which interest the progressive land owner. The tenant expects to be on the farm for one season, to take all he can get from it, and to move onto another farm the next year and repeat the operation. It seemed as though there was nothing this county agent could undertake which would break down this ruinous system of soil depletion. The fundamental problem in that county is the attitude of the banker, the credit merchant, and the landlord. If the county agent, under such circumstances, will devote some of his time in the next few years to demonstrate to these people that a different system of tenantry, a longer term and better tenant conditions, will bring about a better agriculture and a better rural life, he will be doing a great piece of work. I am satisfied that the county agent could do that, but not by leaving the selection entirely to communities. So I have recommended him to do what the South Carolina extension director is trying to do for the negro tenants, namely, to demonstrate to landlords and to those controlling the short time credit to farmers, the benefits of a better system and longer lease, better living conditions and a plan of soil improvement which will utimately result in better satisfied tenants, and better satisfied landlords.

In many instances it may be necessary to secure the cooperation of investigation forces to find out what is the problem of the people of a particular section. Investigational work in farm management should often accompany extension work in finding out the real problems, in order that the county agent project may be benefited by the most up-to-date knowledge.

The county agent's projects or plan of work for each county, as a rule, are not submitted to the States Relations Service as are the project agreements which constitute the general plan of work for the State. Under ideal circumstances, the county plan of work ought to be approved by the county council or central organization representing the people, by the county agent, and by the proper administrative officers of the cooperative extension service in the State. The administrative officers, including the director, state agent or leader, and his assistants, should have copies of the county plan in order that they may know what is going on and keep track of the county agent's activities. As a part of the plan of work the county agent should have a map of his county on which he keeps a record of the

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location and character of his different activities by tacks or symbols, and a copy of this map should also be in the hands of the director of extension or in the central office. In addition to this, community organizations ought to have maps showing the progress of the work in their communities. The county agent's project is a forecast of what he expects to do. At the end of the year he should make a report showing what has been accomplished during the year. Annual projects and reports should constitute the most valuable history of the progress of the work in each county, and should offer one of the best means of judging of the efficiency of the county agent.

There is one phase of this subject which I have not time now to consider, but it should be taken into account in every full consideration. When we come to have a man as county agricultural agent and a woman as county home demonstration agent in every county, while it may be preferable to keep the two projects or plans in a measure separate, they must, nevertheless, be drawn with due consideration for each other, and must together constitute the consistent and united plan of work.

In this brief way I have tried to cover the chief features of the plan of work or project for county agents. It must be remembered that the county agent touches in his work, not only agricultural instruction but also rural betterment, the improvement of production, marketing and distribution of food products of the country, and that in the work as a whole, consideration must be given to the development of rural life in all its phases.

THE CHAIRMAN. Director R. K. Bliss of Iowa will continue the discussion.

THE WRITTEN PROJECT SYSTEM (*b*) AS AFFECTING THE WORK OF COUNTY AGENTS

BY R. K. BLISS

In discussing the written project system as affecting county agent work I desire to make it clear at the outset that we in Iowa have not as yet required definite projects, as that term is commonly understood, covering all lines of work. Our agents, however, plan their work carefully so as to eliminate lost motion and meet the actual situation in the most practical way. What I have to say, therefore, will be a mixture of what we have done and what we hope to do.

It is well to recall briefly the probable extent of county agent work, the nature of the work, and the forces with whom the county agent will be expected to cooperate. In Iowa, for example, there are 99 counties. The average county has approximately 2,180 farms, representing about $40,000,000 of agricultural wealth. Two-fifths of the land is rented, which means, under our short-term lease system of renting, a large shifting population without permanent interest in the community. Organizations such as farmers' club, granges, women's clubs, tax-payers leagues, commercial clubs, farmers' institutes, cooperative elevators and creameries already exist.

It is proposed to place a county agent in each one of these counties, with its different kinds of farmers and farmers' organizations, for the purpose, primarily, of improving the agricultural production of the county and, in some cases, directing or redirecting rural life. Obviously the extension department should furnish the new agent with as much concrete information concerning methods of doing county agent work as it is possible to procure. It should be especially careful to furnish information as regards successful methods or organization of farmers in the county.

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As I view it, the county agent conducts a branch office of the extension department and is the leader of the agricultural extension work in his county. As leader of this work he has to meet much the same problems in the county that the director of extension work meets in the State. He has both organization and teaching work to do and he should cooperate and work with existing organizations. His office should be, in fact, the center of the agricultural educational activities of the county.

The county agent is in intimate contact with keen business men; hence, it is of the utmost importance that he conduct his work in a business-like way. Moreover, he is continually advising farmers to be business-like, to plan their work, to keep accounts and know what they are doing in their farm operations. The agent should practice exactly what he preaches. If he follows a topsy-turvy, hit and miss method of work, his influence is likely to be against carefully directed effort rather than for it. The very nature of his work, however, touching as it does so many different interests and difficult problems, is liable to lead to indefiniteness, unless outside pressure compels it to be orderly and definite.

In order to accomplish this, the agent must be exact in his arrangements. Misunderstandings should be reduced to a minimum. Even in the ordinary business of a county, the agent will accomplish the most who makes in writing all arrangements involving demonstrations, short courses, or other farmers' meetings. Verbal agreements are a continual source of trouble and annoyance. Too often there is not a clear understanding as to just what each party is expected to do. Important details will be omitted or overlooked in a verbal understanding that will be readily apparent if written down. After a few weeks' time, important details of verbal agreements are often forgotten by one or the other of the parties concerned. The written arrangement is the best way of preventing friction and distrust.

A written project is simply a plan or a course of action or an agreement on paper. To require a county agent to submit a plan covering the work of the year, simply means that he is required to do careful thinking and planning in order to arrange his time and spend the money at his disposal in the most effective way.

Lest I be misunderstood later on in regard to written projects, I desire to state in a general way our belief in regard to projects. We in Iowa believe in definite plans or projects, in so far as it is practicable to use them without being encumbered with red tape. We believe that each individual state has to work out its own projects to suit its own conditions. We believe that each county organization with its agent should initiate projects suitable for the county. In other words, we believe in treating the county as we would like to be treated. We do not believe that it is possible to standardize projects either for states or counties. If this is done we believe that more will be lost through restricted initiative than will be gained through administrative efficiency, and if care and good judgment are exercised the initiative and administrative efficiency can both be retained. In other words, our plan is to encourage the county organization and agent to assume the principal responsibility for the success of the movement. We want the people in the county to feel that it is their work; that it is to their interest to make the movement succeed; that if the county achieves what it ought to achieve agriculturally the development must come from the inside out rather than the outside in.

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We believe that this plan of procedure will in the course of time develop an agricultural people, strong, resourceful, self-reliant, independent, able to cope with their own problems and will in the long run achieve a great deal more for the cause of agricultural development than will a system which determines what the agent and county shall and shall not do and furnishes them with a ready made plan of procedure.

We carry out the same idea of local responsibility and local development in all our educational work. For example, a community wants a large short course. Definite printed instructions are sent to the community desiring the course, which outlines carefully how to organize a short course and how to go about it to get it. The requirement for a large short course is either an advance sale of 75 or 100 tickets or a pledge guaranteeing the expenses of the course signed by 150 people, mostly farmers. If a county agent wants a small three-day course he is required to procure a request for such a course signed by a reasonable number of his people in which they agree to take charge of all local arrangements. By adhering to this policy, local leadership and the ability to go ahead and do things in the community irrespective of outside influence will be developed.

In our judgment it is much better to help people to help themselves than it is to give them the help without any effort on their part. We feel that local people ought to use their heads in working out plans as well as their heels in executing them. Our supervision of counties, therefore, and the plans which we require counties to draw us, are designed to develop local initiative on the part of the county as well as administrative efficiency on the part of the college extension office.

My observation in extension work is that if you can get into a community and get the local people to take hold of a proposition and push it themselves, you will get further than if you try to do it yourself. I have seen a community revolutionized through the influence of a cow-testing association, and the point of contact that brought the people together was the cow. That community accomplished much more along the line of rural social welfare than would have been the case if we had sent an extension man in there, labeled as a rural sociologist, to work with the people; and they did it without knowing it. I have seen cases like this over and over again. If you place the responsibility upon the local people you lead them to become an independent people, able to take care of themselves; if you assume the responsibility yourself, it leads towards paternalism, and the people expect the government to look after them. The difference in the two methods while very slight in the beginning may be very important in the end.

We, therefore, expect each county agent to make a careful study of the needs of his county. In making this study the agent is expected to confer with and get the active help and cooperation of his executive board and of farmers in the county. Then, in cooperation with his board, he can work out general plans covering the work of the year. These plans should estimate carefully the amount of time that can be given to different lines of crop or livestock demonstration work in the county and should state as definitely as possible how educational work is to be done. I do not see that the development of local initiative minimizes in any material degree the definiteness in doing this work.

It is impossible under our conditions to make very definite plans as regards educational work, for the reason that the county agent cannot

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anticipate far in advance just what his county will need. He cannot, for example, anticipate hog cholera, or a cold bad summer resulting in poor seed corn, or hessian fly or other emergencies that may arise and alter carefully laid plans. The county agent should submit his plans to the state leader and director of extension work, but in my judgment they should not be materially changed by the central office unless the agent and the board of directors are in full accord with the change, or unless they are so poor that it is absolutely necessary to make changes. Judgment and good sense should dictate the action taken.

Extension specialists representing different subject matter departments of the college should, so far as possible, prepare projects covering their various lines of work having in mind the needs of organized counties with agents. The agents will then know exactly what the specialist has to offer and what he will have to do in order to get the specialist's services. These projects should be as simple as possible and should be prepared in cooperation with the director and state leader and should then be submitted to the agents for their consideration and approval. These projects should not be forced on the agents. The actual preparing of the projects covering the work of specialists and agents could probably be accomplished best in conferences held for that purpose.

Special projects should be prepared for special campaigns or to meet a special need. In the recent seed corn campaign through the schools in Iowa, a project was drawn setting forth clearly a plan of action to pursue in putting on the campaign. This plan helped all the agents, and especially new agents, in that it set forth an exact method of procedure in order to attain the desired results. The plan suggested that each agent get a number of his own farmers to help, train them as to how to do the work and then with their help visit every school in the county. Several of the agents trained from 15 to 30 of their farmers who entered cordially into the program, with the result that the campaign was more successful than we dared to hope for. That is, they went into every school in some counties and took the children and the teacher and went out in the field and picked seed corn and strung it up. They did not give a speech. They just took the pupils out there and did the work.

The agent should cooperate as much as possible with the existing school system, and he should have a project mutually agreeable to himself, to his board of directors, and to the county superintendent of schools covering that work. In this way he will have a definite written understanding which will work for efficiency and promote harmony.

A written project or plan has both a present and a future value. Its present value lies in the fact that it outlines a definite, clear-cut plan of action and prevents the agent from being diverted by minor matters. Its future value lies in the fact that an exactly similar situation to that which made the project necessary in the first place may occur again in the same county or in a new county and, if so, the old project will be of great value in formulating a new one. In other words, if a project is drawn for each important piece of work in a county, it will mean, eventually, an accumulation of valuable material in the central office which can be used most advantageously in meeting new situations and in helping the new agents get started to work.

As administrators of this work, we must devise a plan which will work more or less automatically. That is, it must be a plan which a new agent

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can get hold of quickly and by its help proceed intelligently. When each county gets an agent, it will mean considerable changing each year. Old agents will be dropping out and new ones taking their places. It will be no small problem properly to train these men so that they can start in where their predecessors left off and know exactly what their predecessors did and how they did it. In order to do this efficiently the people in the county should have trained leadership and there must be on file, in the county and in the central office, previous reports and plans for the county.

Finally, we should keep in mind that county agent work is developing into a big business. One agent to each county in Iowa means an annual expenditure of from $300,000 to $500,000. Many other states will spend more. To permit this amount of money to be expended without carefully worked out plans, would simply invite carelessness, inefficiency, and waste of public funds, and, ultimately, defeat the very purpose which it is hoped to accomplish. The business of those charged with the expenditure of this money is to see to it, so far as it is humanely possible, that every cent is not only accounted for but is effectively used. I know of no way that this can be done better than by requiring of each agent a carefully worked out plan of procedure.

THE CHAIRMAN. There is in the office of the States Relations Service a man who has devoted considerable attention to a study of the relationship between economic conditions existing in rural communities and the education within those communities. Mr. E. Merritt, of the States Relations Service, will discuss some of these factors.

ECONOMIC FACTORS TO BE CONSIDERED IN CONNECTION WITH THE PROJECT FOR EXTENSION WORK AMONG FARM WOMEN

BY E. MERRITT

Since there is very little information regarding the economic position of the farm woman, it is necessary to approach the problem by the indirect method and use such material as will point out some of the factors influencing her life. It has been assumed in many of the discussions of our rural problems that social influences were predominant. However, a study of those influences which affect the farm woman's life, her happiness, and prosperity, are found to have an economic basis. The economists tell us that there is a flow of labor from one class of occupation to another, similar to the flow of money or gold from the different money markets in the world. Anything that tends to upset the supply or demand of labor sets in motion the migration from one part of the country to another, or from one country to another.

Among the factors upsetting the equilibrium of the supply of female labor in our rural and urban districts, are difference in death rate, difference in birth rate, increased efficiency, and migration. When we compare the death rate for females of the same age, we find that the rate is higher in urban than in rural districts, with the exception of a few years in the middle life. The influence of the higher death rate in the city than in the country is also evident when we compare the average age at death of the persons in the rural and urban districts. We find, for example, when we compare the average age at death of males for the native born of native parentage, that it is 38.2 years in the rural districts, and in the city 31.4

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years. If we consider that the average person becomes productive at 15 years of age, this would mean that the average male in the rural district would have a productive life of 23.2 years in the rural district and 16.4 years in the city, a difference in favor of the person living in the rural district of over 40 percent. In the case of females, we find also that the difference between the average age at death is 5.5 years. The average length of the productive life of the woman in the country being 25.7 years and in the city 20.2 years, indicates a difference in favor of the rural districts of over 20 percent. The returns also indicate that the difference between the males and females in rural districts is 2.5 years in favor of the females, whereas in the case of the males and females in urban districts, it is 3.8 years in favor of the females. In other words, the conditions under which women work and live in the rural districts, when compared with the conditions under which the men work and live in the same districts, apparently more closely correspond as to healthfulness than the conditions for men and women in the city. This difference in the healthfulness of the rural and urban districts has a marked influence upon those who have reached the productive age period. We find that the average age at death of those who have reached 15 years of age is 59.1 years for the females, native born of native parentage in rural districts, as compared with 55.3 years in the urban districts. This difference in the average age at death of women has an important economic bearing not only upon the length of her working life but upon the possibility of increasing the number of children that may be born to her.

A second factor to be considered is the difference in the birth rate. We find that the average number of children born to women under 45 years of age and married from 10 to 19 years, who are native born of native parentage, living in urban Ohio and Minnesota, was 2.4. In other words, if these cities were entirely dependent upon the children of the native stock they would fall 20 percent short of reproducing their kind. However, when we turn to the rural sections of these states, we find that the average number of children born is 3.4 indicating that the rural women are not only maintaining their own, but adding 10 to 15 percent to the population. To make up the deficiency in the urban population and to increase the supply of labor necessary to carry on their growing industries, it is necessary for the cities to import labor from the rural districts and from foreign countries, and even after the foreigner comes into the city, apparently the economic and social conditions of the city tend to make the foreigner have a lower birth rate than the same class in the rural districts. That the city has a marked sterilizing influence upon its women is evident when we compare the percentage of those bearing no children. Bearing in mind that these women have been married from 10 to 19 years, we find that in the case of urban Ohio, one out of seven failed to bear any children and in urban Minnesota, one out of eight. However, when we turn to the rural parts of these states, we find that only one out of 18 or 19 failed to have children. Since the women in the rural districts marry at younger ages and in greater numbers, and live longer lives, this offers an explanation in part for the higher birth rate, but when we compare the average number of years married per child born, we find that as a rule the rate is much higher in the city than in the country.

The third factor to be considered is increased efficiency. Thirty or forty years ago 50 percent of those who were gainfully employed were

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engaged in agriculture, whereas today about one-third of those "gainfully employed" are engaged in agriculture. In the meantime, there has been an increased per capita production of crops and vegetables, and live stock produce has maintained its own or increased slightly as regards certain items. The farmer, by the use of improved machinery, the better distribution of his labor throughout the year, and the more economical employment of horse and other power on the farm, has increased his efficiency so that 15 percent of those formerly employed in agriculture are released to go into other occupations. Of course, this has affected equally the males and females.

If we examine the curve made by determining the percentage of persons of the same age and sex living in rural districts, we will find that for the United States as a whole, there is a tendency for the percentage at 10 years of age to be slightly higher than at five years. Apparently, the higher death rate in the city than in the country causes a larger proportion of those who are five years of age to survive in the rural districts, with the result that the percentage tends upward. Beginning with 10 years of age, the migration from rural districts sets in, the women migrating in larger numbers and at earlier ages. At 35 years of age the migration practically ceases and the higher death rate in the city than in the country causes the curve to rise again. This curve is more or less typical for all of the geographic divisions. However, consideration should be given to the proportion living in the city and in the country in determining the trend of the curve. For example, in the New England States, where apparently only one out of five persons live in the rural districts, the higher death rate in the city than in the country has quadrupled effect, with the result that between five and 35 years, the curve is practically a straight line. However, in the South Atlantic States, where four persons are living in rural districts to one in the city, the influence of the migration from rural districts in sufficiently strong to cause the curve to tend downward. If we plot a similar curve for conditions in England and Wales we will find that it has the same characteristics in showing that the women are leaving the rural districts faster than the men and that the minimum is reached between 25 and 35 years of age. However, when we plot the curve for conditions in Austria and Germany, it indicates that the men are leaving the country faster than the women.

Another method of indicating what the influence of the migration of women is, is to determine the percentage of males in the rural and urban population. We find that at five years of age, for the United States as a whole, there is an excess of males in the rural and urban districts and that this excess is greater in the rural districts. The women migrating faster and at earlier ages than the men causes the curve to tend upward, but as soon as the migration of the men is in full sway, the curve comes back to normal. The migration of women is sufficiently larger than that of the men to cause an excess of females in our cities after the 15-year age period is reached. A striking exception to this condition is found in the Southern States. Among the native whites, we find that there is an excess of females in the middle age groups. If we determine the counties which have an excess of females in the rural districts, we will find that they are few and scattered for the whites, whereas for the negroes the majority of the counties in the Southern States have an excess of females in the rural population, and a study of the distribution of the sexes by ages reveals the fact

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that this excess is due to an excess of females in the middle age groups. Thus, it is evident that apparently the same conditions that cause an excess of females in the middle age groups among the native whites, is having an even stronger effect upon the negroes.

In order to indicate the importance of women in the agricultural systems of the different countries, the percentage of those gainfully employed in agriculture was ascertained. It was found that in Austria and Germany between 45 and 50 percent of those gainfully employed in agriculture were women, and in the case of the East South Central, South Atlantic, and West South Central States, between 20 and 25 percent, and in the Northern and Western geographic divisions, only three or four percent were so employed. In England and Wales, the percent was 3.3. In other words, the economic importance of women in the system of farming tends to influence her movement from the rural to the urban districts. Thus, if it is considered advisable to keep a larger proportion of women on our farms, it will be necessary to make farming as economically attractive as the nearby towns.

The employment of women in agriculture may influence the standard of living as well as the standard of farming. Let it be assumed that the standard of living and the standard of farming are represented by an income of $1,000. Let it be further assumed that the woman by her efforts, produces $100 worth of produce. The standard of farming can be reduced to the $900 grade and the $1,000 standard of living maintained, or the standard of farming may be maintained and the standard of living raised to the $1,100 grade.

Both of these tendencies are taking place in the United States. In connection with the growing of beets, onions, and other intensive crops, women are being employed in the field to the detriment of their health and that of their children and of their intellectual and spiritual development. The employment of negro women in the cotton fields in the South is bringing about a type of farming which results in economic and social conditions under which the whites will not live, with the result that there is developing, wherever the negro is getting extensive hold of the land, a black belt in the South. In the New England and Middle Atlantic States, the foreign farmer, with his cheap source of labor in his wife and children, is able to outbid the native farmer for the possession of the land, so that during the last 30 years there has been an actual decrease in the native born population, the foreigner and his children increasing from 10 to 40 percent. In the Middle West, the extensive use of agricultural machinery and the better distribution of the labor throughout the year, has taken away from woman her economic importance in the type of agriculture which is being carried on, with the result that in these regions she is leaving the farm more rapidly than in any other part of the United States; this, in spite of the fact that probably the farm incomes are higher in these regions than elsewhere.

Another economic factor to be considered is the relationship of the management of the home and the management of the farm. It is considered good farm economy to produce on the farm the raw material to feed the animals and to produce this material in the proper proportions to give the live stock a balanced ration. It should also be considered good farm economy to produce on the farm the necessary articles to comprise the food of the farm family and this in proportion to make a suitable diet. We have no definite information regarding what the farm contributes to

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the farmer's living, except a few studies made by the Office of Farm Management. These indicate that the farms visited purchased one-fourth of the animal products, one-third of the fruits, one-fifth of the vegetables. The value of these purchases equalled the income received by two-fifths of those who had cooperated with the Northern and Western office in their farm management demonstrations. In other words, if these represent the average condition, two-fifths of the farmers spent their entire labor income in purchasing those things, the greater part of which they might have produced.

Thus, it seemed important to examine the census to ascertain what light it could give regarding the relationship of the farm and the home supply of meat, fruits, and vegetables. It can be assumed that if a certain animal is not slaughtered on a farm that there is not present this home supply of meat. Pork, which comprises one of the principal meats consumed on farms, apparently is absent in a marked degree from the system of farming as now carried on. In the New England States, apparently only one out of three farms report swine slaughtered. In other words, two out of three farms purchased all the pork consumed. In the Middle Atlantic States, three out of five reported animals slaughtered and even in those regions having the largest proportion of farms reporting swine slaughtered, one out of three failed to report this source of food supply. In the far Western States, only one out of four reported swine slaughtered. When we come to the dairy cow, we find that she is present on most of the farms. However, even in the most favorable regions, she is absent on one out of 10 farms. Since the home dairy industry is so closely connected with the work of the farm woman, it is interesting to note that only 16 percent of the farms reported raw milk sold, whereas 75 percent of the farms reporting dairy cows reported butter made on those farms. Apparently, the farm-made butter comprises 60 percent of the butter made in the country and 40 percent of the butter of commerce. Poultry, although present on practically all of the farms, occur in such small numbers as to be, as a rule, but a small source of income. Farm management studies indicate that a flock of 100 head with a little extra care and attention, can be made a good source of minor income for a farm. It is interesting to note that the value of the home-made butter and the production of poultry and eggs on the farm are exceeded in value by only four crops; cotton, wheat, corn, hay and forage. Yet, in our extension work these do not seem to be receiving the attention their importance would indicate.

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PERCENTAGE OF ALL FARMS REPORTING ANIMALS SLAUGHTERED, DAIRY COWS AND FOWLS

Division	Animals slaughtered				Dairy cows	Fowls	
	Cattle %	Calves %	Swine %	Sheep %	%	%	Average number
New England	9.0	5.7	35.4	1.8	77.9	79.8	47
Middle Atlantic	15.6	8.9	57.2	1.3	85.5	91.5	61
East North Central	10.5	6.2	65.8	1.2	89.9	93.1	69
West North Central	17.8	5.7	64.5	1.3	89.1	90.8	88
South Atlantic	4.7	1.9	60.0	1.0	71.5	87.4	29
East South Central	4.5	1.2	57.3	0.9	78.2	86.1	30
West South Central	5.0	1.7	51.8	0.3	76.6	85.7	39
Mountain	12.5	5.0	26.5	3.0	65.6	69.2	45
Pacific	9.1	13.0	27.2	1.6	73.6	78.1	69

Another important source of the farm food supply is vegetables. Potatoes, a crop which we consider as universally grown and eaten, were absent on one out of four farms in the New England States; on one out of seven in the Middle Atlantic States, and in the far West, or one out of three. We also find that the conditions were similar regarding the vegetable garden.

PERCENTAGE OF FARMS REPORTING POTATOES AND VEGETABLES

Division	Potatoes		Sweet Potatoes		Vegetables, (excluding potatoes)	
	1909	1899	1909	1899	1909	1899
New England	79.1	81.7	*	*	78.5	62.1
Middle Atlantic	85.5	86.3	4.0	5.9	81.8	70.1
East North Central	77.0	72.9	3.5	5.7	75.0	63.1
West North Central	70.5	68.1	4.2	5.4	64.4	57.6
South Atlantic	31.5	28.1	43.5	43.9	70.9	66.1
East South Central	29.5	22.9	35.3	32.0	71.4	66.2
West South Central	20.1	19.1	17.3	18.5	50.5	53.7
Mountain	35.5	35.1	0.2	0.2	37.6	32.2
Pacific	36.6	38.2	0.6	0.4	49.9	39.3
United States	50.0	49.4	17.6	17.5	67.0	61.3

*Less than one-tenth of one percent.

The third great source of food on the farm is the fruit trees. However, in regions favorable to their production, we find that a large proportion of the farms failed to report any trees. Apples, a crop that can be almost universally grown in the northern group of States, are absent as a rule on one of three or four farms, as were the other principal fruits, such as peaches, pears, plums and cherries. Even in the regions which would seem most favorable to their production only about one out of three report

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this source of food for the home. Grapes, another important source of food, even in the most favorable regions, are only present on one out of four farms.

PERCENT OF THE TOTAL NUMBER OF FARMS REPORTING TREES OF BEARING AGES

Division	Apples	Peaches	Pears	Plums	Cherries	Grapes
New England	72.1	6.8	25.6	13.2	8.4	10.1
Middle Atlantic	80.8	23.9	46.0	31.8	38.4	26.6
East North Central	60.0	33.8	32.1	13.2	38.9	25.0
West North Central	50.7	27.8	14.4	22.8	26.2	18.4
South Atlantic	44.7	32.5	18.1	10.3	12.9	12.5
East South Central	34.8	32.9	12.4	8.9	7.2	7.1
West South Central	16.1	29.0	9.8	11.4	4.6	5.5
Mountain	19.8	8.2	8.2	11.2	9.5	2.2
Pacific	37.2	19.2	28.2	29.1	24.3	13.0

Thus, in drawing up the extension projects, it would seem to be necessary that the person in charge of the extension work for women should call into conference the farm management specialist in order that he might advise her, or cooperate with her, in changing the system of farming whereby the crop system might be more evenly distributed throughout the year, so that the women and children will not be forced, during the rush season, to work in the fields beyond their strength or to a point which will injure their health. She might also need his advice in developing a farm industry which would give women a source of income. Such studies as have been made indicate that a very small percentage of the farmers yearly receive an income sufficient to allow them to pay expenses of living and introduce extensive improvements in their homes.

Thus, if the specialist in charge of the work for the farm woman wishes to improve the home, it may be necessary to introduce a new industry into the system of farming or so to improve the farm conditions that the money will be made available; and in some instances this work may have to be undertaken by the farm woman herself. Further, if it is considered advisable to retain more women on the farms in a given community, a new industry may be required to give her employment.

In addition to the farm management specialist, the animal husbandry specialist should be consulted in order that there may be introduced a system of farming whereby the farm would at least produce its own supply of pork. The dairy specialist should be consulted in order that the quality and quantity of home-made butter may be increased. The poultryman's advice should be sought in order to increase and make profitable the farm flock. There should also be called into consultation the horticulturist in order that the farm may have sufficient variety of fruits and vegetables to produce a balanced diet for the family and to provide fruit and vegetables for the entire year. Many of the operations advised by these men would probably mean that the farm woman should take them up herself; but care should be taken that the activities of the woman, outside of her home, do not lead to a condition whereby the farmer may shirk his resposibility in maintaining his present standard of farming. This can generally be avoided

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if the work is so arranged that the farm woman can retain absolute control over the products of her labor.

Miss V. I. Paradise of Washington, D. C. What is meant by giving women employment? As farm laborers, or is it included in the work of farmers' wives?

E. Merritt. The "gainfully employed" definition is the one adopted by the census office. If the women spends perhaps more than half of her time in field labor, she will be considered as gainfully employed in agriculture; but it does not include her duties as a housewife.

Miss Paradise. Does the birth rate take into account the whole United States?

E. Merritt. No. The charts related solely to a special investigation made in Minnesota and Ohio.

The Chairman. The second general topic for discussion this afternoon deals with "National Conferences on Extension Projects—Their Advisability and Necessity." The first speaker will be Mr. C. B. Smith of the States Relations Service.

National Conferences on Extension Projects—(a) Their Advisability and Necessity

By C. B. Smith

In their extension work the Land-Grant Colleges and the United States Department of Agriculture are engaged in a very great enterprise. It is for the most part a cooperative enterprise, made so by federal law and by mutual agreement. This work on a systematic nation-wide basis is new. The cooperative relationships in it are new. In initiating a new work and taking on new relationships, even in a small enterprise, frequent conferences and considerable adjustments are necessary before the enterprise runs smoothly. How much more necessary is it then in an enterprise nation-wide in scope, involving millions of dollars, thousands of employees, great diversity of subject matter, and most complex relationships, that conferences be held.

The Department of Agriculture and the colleges are responsible for the plans in extension work and the expenditure of funds for extension work carried on either with Smith-Lever or United States Department of Agriculture funds. If these two cooperating parties knew just what extension plans to approve for the good of the State as a unit and for the Nation as a whole, no conferences of any kind would be necessary; but unfortunately that knowledge is not yet present in the Department of Agriculture, the colleges or any other agency, and will not be for some time to come.

It is because the extension work supported by Smith-Lever and department funds is cooperative, because the Department of Agriculture is administratively responsible to Congress for it, because the work is new and complex and of great magnitude, and because the cooperating parties are unacquainted with each other and do not yet know just what to do or just how best to do the work, it seems necessary that there be national conferences in which departmental officers and extension directors and

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leaders of projects in the field will take counsel together and work with each other in the interests of this great cooperative enterprise.

In a cooperative work, above all others, if there is to be harmony of purpose, unanimity of action, mutual confidence and strong united team work, there must be that intimate acquaintance and belief in each other that comes only through personal contact and counsel together, such as national and sectional conferences make possible.

We may consider for a moment the kinds of national extension conferences the Department has called in the near past and the kind it may desire to call in the future, with the idea of showing its point of view with reference to these matters. For this purpose we shall deal with the conferences called to consider extension work relating to the Northern and Western States. The conferences called on a nation-wide basis have dealt with (1) County Agent Work; (2) Boys' and Girls' Club Work, and (3) Farm Management Demonstrations, respectively. In each of these lines of work the Department of Agriculture has been spending large sums of money, given to it directly by Congress, and for which it is administratively responsible. The county agent work was initiated as an extension project by the Department of Agriculture. The first year of its development in the Northern and Western States it was largely financed, in so far as the colleges and the Department were concerned, with funds furnished by the Department of Agriculture. It was a new work; conditions varied greatly in the different States; leaders of the work, both state and federal, were evolving methods of organization and administration. A conference at that time of the leaders who were carrying on the work in the field was deemed absolutely essential to an intilligent understanding of the problems in the field and efficient administration of that work. During the five years in which the county agent work has been developing in the Northern and Western States there have been four national conferences, two in Washington and two in the Central West. We are inclined to think that each conference has justified itself in the results accomplished in unifying and stabilizing the movement as a whole, and giving administrative officers of the colleges and the Department a correct point of view of the work and of its place in the extension field. I am not certain that this phase of the work has yet reached a stage where it will be desirable to discontinue national conferences, though it may not be necessary to hold such a conference each year. Now that general principles are pretty well settled, sectional conferences may suffice. In this work the Department has gone on the principle that the college men working on this common problem could arrive at fundamental policies and plans sooner by counseling together and with the departmental men, than would be possible otherwise.

The reasons cited for calling a national conference of county agent leaders may be applied equally to the national conferences on club work and farm management demonstrations. The Department has large sums of money invested in both these projects. It wants to assure itself through counseling with the men in the field conducting the work that the Department is handling its end of the cooperation in a satisfactory, helpful way, and if not, how it may do so. It wants to find out first-hand the difficulties being encountered in this new work, the steps being taken to meet these difficulties, the reception of the work by people for whom it is intended, and the probable desirable organization for the work in the different

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sections. That is simply common sense in administration. The Department regards it also as good administration that the States should counsel together on such a common problem as much for their own information as for that of the Department. With the common understanding usually reached at such a conference the handling of the extension work from an administrative standpoint is greatly simplified on the part both of the State and of the Department.

For the first time since the work was launched, the Department will not call for a national conference on farm management this year. Its representatives however, will want to visit the farm management demonstrators in every state in which it is cooperating in order to study that work in the field. Now the farm management demonstrators are engaged in a new line of work. The way has not been blazed for them. They are eager for help. In the national conferences heretofore called they have secured counsel and help from each other. This year the department's agent will be the only common carrier of ideas in that work. There is much more probability that the work will follow along narrower lines as a result than would be the case were a national conference called where all could counsel together and shape up their plans.

So much for the reasons for holding national conferences where the Department has money invested. Will it desire sectional or national conferences where no direct departmental appropriations are involved, nothing but Smith-Lever funds, and if so, on what grounds? Answering the query in part I may say it may desire conferences, even when only Smith-Lever funds are involved, because it has administrative relations to these projects and is responsible to Congress for the proper expenditure of these funds. It must agree to the projects and approve them before funds are available to the States for their prosecution. In this manner the Department is a partner with the States in such extension work. If it is a partner in that work and must pass upon those projects from year to year, it is essential that it do so understandingly. Anything else would not be dealing justly with the States or satisfactory to itself. The reasons then for desiring a national or sectional conference of extension workers on Smith-Lever funds, would be as an administrator, first, to inform itself so that it might do its part wisely and, second, to facilitate exchange of thought among the States themselves and thus hasten the standardizing of the movement.

This exchange of ideas among extension workers along a common line facilitated by a national conference is a matter of considerable importance from a federal administration standpoint. It will be appreciated that some states when they take part in a national conference may accept promptly and wholeheartedly lessons which other states have to teach which they might not so readily accept did they come from the Federal Government alone.

Let me illustrate by a specific example why the Department might desire a conference on a Smith-Lever project. We will say that the Department of Agriculture has no direct appropriations to put into home economics extension work, but that every state is carrying on extension work in home economics with Smith-Lever funds. Since the States are using Smith-Lever funds in this phase of extension work their projects must necessarily be approved each year by the Department of Agriculture. We will say that the Department has had little or no experience in extension work in home economics. It has, however, a great deal of subject matter

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available for extension work among farm women and is greatly interested in the organization and coordination of that work. Let us suppose that the projects submitted to the Department on home economics from the various States are exceedingly miscellaneous in character—plans for this work being as diverse as the States from which they come. Now the Department at the outset must tentatively pass on those projects as best it can, but it can not with satisfaction to itself or with justice to the movement continue to sit in judgment on those projects without some adequate knowledge of how the matter is working out in the field. It may send its agents to the field and inform itself as to what is being done, and find there, as it usually does, both strong and weak features of work in the different States.

The Department by such a study may reach a conclusion for itself and could perhaps follow its findings in passing on projects for the succeeding year. Its position would be much stronger, however, and the findings receive much more ready acceptance, if the States conferred together and reached that same conclusion as a result of their joint deliberations. When the leaders of a project come together after a year's experience in the field and present their methods and results, followed by a questioning and discussion of the strong and weak features of the work, it is possible usually to draw a far safer general conclusion, very helpful in an administrative way, in passing intelligently upon such projects when presented for consideration.

Of course national conferences in the past and as contemplated for the future are desired only in the case of new and undeveloped lines of work. There is little occasion for national conferences on old, well established lines of work, but relatively new extension work, such as county agent work, boys' and girls' club work, and women's work, all involving matters of organization and relationship, will undoubtedly need to be considered in a national way a number of times in the future before the work will reach such a stage that conferences of extension directors alone will be sufficient to handle the work.

We may summarize then by saying that national conferences on extension work, carried on with both departmental and Smith-Lever funds, are believed essential—the letter of information or the circular can not take the place of the living conference—both for the information of the Department and for the information of the States. They are essential because the work is new and because administrative responsibility both on the part of the Department and the State necessitates intelligent readjustment of the projects as rapidly as new and sound information is available, and because upon the proper adjustment of these major organization projects depends in large measure the success of all other extension work of both the college and the Department.

Finally, national conferences are desirable because the extension work is cooperative, not only cooperative between the Land-Grant Colleges and the Federal Department of Agriculture, but may we not regard it as cooperative between the States themselves.

Is not attendance at a national conference the least that a State can contribute towards a cooperative enterprise? A State may be so well organized along extension lines that it has nothing to learn from a national conference, but when it arrives at that happy state ought it not attend and give freely of its abundance for the benefit of its less fortunate sister states?

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It is desirable that the State think not merely of itself in the cooperative work but of what it can contribute to the common good.

The chief thought that I would leave with you, however, is that national conferences give opportunity for the extension forces of the States and of the Federal Department of Agriculture to get together and talk things over as friends in a friendly way and as cooperators, both desirous of understanding each other and of contributing to the utmost of their ability toward the success of a common enterprise for which both are responsible.

THE CHAIRMAN. A Plan for Reducing the Number and for Retaining the Value of National Conferences will be presented by Director M. S. McDowell of Pennsylvania.

NATIONAL CONFERENCES ON EXTENSION PROJECTS—(*b*) A PLAN FOR REDUCING THEIR NUMBERS AND RETAINING THEIR VALUE

BY M. S. McDOWELL

The value of carefully planned and well conducted conferences composed of those engaged in different forms of extension activities, such as leaders in county work, club leaders, home economics workers, etc., is fully recognized. Country-wide conferences involving so large a variety of projects naturally present many difficulties. The responsibility of extension directors to their institutions for proper use of funds requires careful consideration of the question of expenditure for conferences. This question involves not only extent of funds but of time of staff members, and adequate recompense for both time and money.

The extension director is directly responsible for the coordination of all phases of extension activities. In other words, he must assume a distinct and direct responsibility in connection with conferences relating to various phases of extension work. It is desirable that he attend as many of these conferences as possible in order that he may keep in touch with all extension activities. Effective conferences require first of all a proper organization. Valuable results cannot be obtained otherwise.

It is important and essential that proper relationships be recognized and maintained. The agricultural colleges, and the experiment stations in particular, must be recognized as playing a most important role in the development of extension work. In the final analysis the research work is the basis upon which extension activities must be built. The extension organization is the channel through which the practical results of the researches of the experiment stations and the United States Department of Agriculture are carried to the people of the several States. These research institutions are responsible for the character and authenticity of the subject matter taught by extension instructors.

There are, therefore, some questions which cannot well be decided and should not be determined except by consultation with the colleges and experiment stations. An illustration may best illuminate this point. The Association of American Agricultural Colleges and Experiment Stations has a committee on extension organization and policy. From time to time this committee has made reports dealing with descriptions and definitions of terms used in connection with extension work. Last year there were adopted at a conference representing one phase of extension activity, definitions of some of the same terms already defined by the Association; but they were

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unlike those heretofore determined. To those engaged in that particular field of service those definitions apparently bore all evidences of authority. In other words, one set of definitions is likely to be circulated by and in the name of the Association of American Agricultural Colleges and Experiment Stations and another set, relating to the same terms but differing in character, by a conference composed of certain employees of colleges and stations. Such a situation is intolerable.

The program of the county agent leaders' conference this year names a committee on legislation to consider existing state laws, and to prepare and submit to the general committee a model state law; also a committee on relationships, to consider the relationships of county agricultural agent work to boys' and girls' club work, farm management demonstrations, farmers' institutes, extension schools and extension specialists. It is proper that these questions be discussed by such a conference, and that action be taken setting forth the views of the conference, if so desired; but the action of the conference should not determine general extension policies. These are for the extension services to determine. Again, there are questions concerning which the colleges and experiment stations must determine the policy to be pursued.

Although each phase of work is a separate entity, all phases are, or certainly should be, a part of one extension organization, and they must be so regarded in working out any scheme for the improvement of extension practices and methods.

Another point to be regarded, in the endeavor to develop a satisfactory scheme for conferences, is the attitude of mind to be engendered among those engaged in extension activities. The rights and relationships of the United States Department of Agriculture to phases of work in which it is cooperating with departmental funds should be considered as a matter of course. The necessity of having the extension workers in individual states recognize the college by whom they are employed as the source of direction must also be considered. Circumstances should be such that extension instructors will be led to feel that the college is the institution to which they must first show fealty. In what direction does the present method of managing these conferences tend to lead the minds of workers in the several fields?

We do not believe that an annual country-wide conference of the various lines of extension workers is necessary or fruitful of helpful results. With so large a conference the discussion is likely to be too general and frequently without application or value to the conditions of a large number of those present. Periodic national conferences, every three to five years, would probably be sufficient. District conferences, however, may be held annually. We believe district conferences offer more desirable opportunities for helpful discussion.

The workers in the several fields should have freedom of initiative and action. So far as conferences are concerned it would seem that in each instance the conference should be in the hands of the workers themselves. They should have their own organization, make their own programs and carry out their own arrangements, subject only to limitations in such matters as have a bearing beyond the particular field of work in which they are engaged, as, for instance, finances and certain general policies. The workers in the several fields should know their own problems best and therefore be in a better position to determine questions regarding con-

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ferences. Furthermore, we believe it is desirable to place the responsibility for the success of their conferences directly upon them. Conflict in the arrangement of programs, which sometimes occurs, would also be thus avoided.

With all these factors in mind I would suggest, as a basis for discussion:

(1) That national conferences of the several groups, such as county leaders, club leaders, home economics leaders, etc., be placed under the general supervision of the Association of American Agricultural Colleges and Experiment Stations, the immediate responsibility resting with its extension section. The Association represents all allied agricultural interests and it is the only organization which offers a center for cooperative effort which involves the Agricultural Colleges and the United States Department of Agriculture.

(2) That a country-wide conference of only one group of workers be held each year, such conference to recur only when all groups have met. In other words, those in charge of county work would meet one year, the next year the club leaders and so on until each group had met. Furthermore, it seems to the writer that such conferences should be held at the same place as and immediately preceding the meeting of this Association. This would make it possible for extension directors to attend these conferences at very little additional expense and also give the general Association opportunity to consider any recommendations or suggestions that might be made by the conference.

(3) That the country be divided into districts composed of from six to eight (or such number as may seem best) contiguous states in which district annual conferences may be held. States outside these several districts may send representatives if they so desire and speakers may be brought in from outside, if deemed advisable.

(4) That the extension section of the general Association be authorized to appoint a conference committee consisting of a representative from each district heretofore suggested. This committee would approve the program of the general conferences of the different groups of workers. Necessary reports and recommendations could be made through this committee by the several conferences to this section, and, after approval, be passed on to the general Association for action.

District conferences can be cared for by the member of the committee representing each district. In the same way recommendations and suggestions from any district conference may be brought to the attention of the Association. It is possible that the main points brought out in these district conferences could be printed or multigraphed and distributed to those desiring them so that helpful points developed would be available to everyone who might be interested. It is not the thought that this committee direct the conference except in a very general way, but that it would serve as a point of contact between the conferences and those next higher in authority who must assume responsibility regarding questions which have a bearing outside the field of activity covered by the several conferences. Although this plan may at first seem complicated, it actually simplifies the whole scheme by providing one organization, namely, the Association of American Agricultural Colleges and Experiment Stations, which becomes, as it should, the clearing house for the various branches of work.

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ALFRED VIVIAN of Ohio. One clause in the report of the committee on extension organization and policy, presented this morning to the Association, provided, in case differences of opinion arose, that they should be referred to the Executive Committee. I understand that as the report was originally drawn up, these differences of opinion were to be taken up first with the committee on extension organization and policy; but this last named committee, being composed of very modest men, did not presume to ask that these matters be presented to them, and so suggested that they be presented to the Executive Committee.

I am authorized by the chairman of the Executive Committee to say that that committee is already so loaded with duties that it does not care to take up matters of this kind, except as a court of last resort. Consequently, it is suggested by that gentleman that all grievances be referred in the first instance to the committee on extension organization and policy, and that only in the event that a grievance cannot be properly adjusted through the good offices of that committee it be brought to the attention of the Executive Committee. I do not understand that the latter named committee cares to have formal action taken upon this matter, but desires that this statement be made to the members of the section for their guidance.

On motion, the section adjourned.

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PROCEEDINGS

OF THE

THIRTY-FIRST ANNUAL CONVENTION
OF THE

Association of
American Agricultural Colleges and Experiment Stations

HELD AT

WASHINGTON, D. C., NOVEMBER 14-16, 1917

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For the Executive Committee of the Association

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PRAIRIE VIEW STATE NORMAL AND INDUSTRIAL COLLEGE, *Prairie View.* I. M. Terrill, *Principal.*

UTAH—THE AGRICULTURAL COLLEGE OF UTAH, *Logan.* E. G. Peterson, *President;* G. R. Hill, Jr., *Director School of Agriculture;* F. S. Harris, *Director Experiment Station;* John T. Caine, III, *Director Extension Division;* R. B. West, *Director School of Agricultural Engineering;* C. W. Porter, *Director School of Home Economics (on leave);* A. H. Saxer, *Acting Director School of Home Economics.*

VERMONT—UNIVERSITY OF VERMONT AND STATE AGRICULTURAL COLLEGE, *Burlington.* G. P. Benton, *President (on leave in European service, National War Work Council);* G. H. Perkins, *Acting President;* J. L. Hills, *Dean College of Agriculture, Director Experiment Station;* T. Bradlee, *Director Extension Service;* J. W. Votey, *Dean College of Engineering;* Bertha M. Terrill, *Professor of Home Economics.*

VIRGINIA—THE VIRGINIA AGRICULTURAL AND MECHANICAL COLLEGE AND POLYTECHNIC INSTITUTE, *Blacksburg.* J. D. Eggleston, *President;* H. L. Price, *Dean Agricultural Department;* A. W. Drinkard, Jr., *Director Experiment Station;* J. M. Jones, *Director Extension Division;* L. S. Randolph, *Dean Engineering Department.*

VIRGINIA TRUCK EXPERIMENT STATION, *Norfolk.* T. C. Johnson, *Director.*

THE HAMPTON NORMAL AND AGRICULTURAL INSTITUTE, *Hampton.* G. P. Phenix, *Acting Principal;* C. K. Graham, *Director Agricultural Department and Extension Work.*

WASHINGTON—STATE COLLEGE OF WASHINGTON, *Pullman.* E. O. Holland, *President;* G. Severance, *Acting Director Experiment Station;* W. S. Thornber, *Director Department of Agriculture and Home Economics Extension;* Agnes H. Craig, *Head College of Home Economics.*

WEST VIRGINIA—WEST VIRGINIA UNIVERSITY, *Morgantown.* F. B. Trotter, *President;* J. L. Coulter, *Dean College of Agriculture, Director Experiment Station;* C. R. Titlow, *Director Extension Department;*

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C. R. Jones, *Dean College of Engineering;* Rachel H. Colwell, *Head Home Economics Department.*

THE WEST VIRGINIA COLLEGIATE INSTITUTE, *Institute.* B. Prillerman, *President;* A. W. Curtis, *Director Agricultural Department.*

WISCONSIN—UNIVERSITY OF WISCONSIN, *Madison.* C. R. Van Hise, *President;* H. L. Russell, *Dean College of Agriculture, Director Experiment Station, Director Agricultural Extension Service;* K. L. Hatch, *Assistant Director Agricultural Extension Service;* F. E. Turneaure, *Dean College of Engineering;* Abby L. Marlatt, *Director of Home Economics.*

WYOMING—UNIVERSITY OF WYOMING, *Laramie.* Aven Nelson, *Acting President;* A. D. Faville, *Dean College of Agriculture, Director Experiment Station;* A. E. Bowman, *Director Extension Work in Agriculture and Home Economics;* J. G. Fitterer, *Chairman, College of Engineering;* Emeline S. Whitcomb, *Professor of Home Economics.*

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List of Delegates and Visitors in Attendance

ALABAMA: C. C. Thach, J. F. Duggar, delegates; G. K. Maloney, C. M. Mouldin, visitors.

ARIZONA: E. P. Taylor, Mrs. Jasamine Chapman Williams, visitors.

ARKANSAS: J. C. Futrall, Martin Nelson, W. N. Gladson, W. C. Lassetter, delegates; J. E. McKell, C. W. Watson, S. P. Weigart, visitors.

CALIFORNIA: B. I. Wheeler, T. F. Hunt, C. L. Cory, C. B. Lipman, delegates.

COLORADO: C. A. Lory, C. P. Gillette, L. D. Crain, H. T. French, A. A. Edwards, delegates; Mrs. H. T. French, C. G. Sargent, visitors.

CONNECTICUT: C. L. Beach, E. H. Jenkins, H. J. Baker, delegates; W. L. Slate, Jr., visitor.

DELAWARE: H. Hayward, A. R. Cullinan, Myrtle V. Caudell, delegates.

FLORIDA: A. A. Murphree, P. H. Rolfs, J. R. Benton, C. K. McQuarrie, A. P. Spencer, delegates; Agnes E. Harris, Harriette B. Layton, Sarah W. Partridge, visitors.

GEORGIA: A. M. Soule, C. K. McClelland, J. R. Fain, Mrs. Bessie S. Wood, J. P. Campbell, delegates; Lois P. Dowdle, Mrs. Edith M. Andrews, G. V. Cunningham, C. G. Garner, J. K. Giles, J. N. Harper, J. G. Oliver, Miss Hoyle Skinner, J. T. Wheeler, visitors.

IDAHO: E. H. Lindley, L. W. Fluharty, delegates.

ILLINOIS: E. J. James, E. Davenport, J. W. Lloyd, A. W. Nolan, Isabel Bevier, delegates; W. F. Handschin, A. J. R. Curtis, visitors.

INDIANA: W. E. Stone, J. H. Skinner, C. G. Woodbury, G. I. Christie, delegates; Mrs. W. E. Stone, Mary L. Matthews, visitors.

IOWA: R. A. Pearson, C. F. Curtiss, Catharine J. Mackay, R. K. Bliss, delegates; W. H. Stevenson, visitor.

KANSAS: H. J. Waters, W. M. Jardine, A. A. Potter, E. C. Johnson, delegates; I. W. Burly, Walter Burr, Wilbur N. Mason, visitors.

KENTUCKY: F. L. McVey, Geo. Roberts, T. R. Bryant, Mary E. Sweeny, delegates; W. H. Rochester, visitor.

LOUISIANA: W. R. Dodson, delegate; W. R. Perkins, visitor.

MAINE: R. J. Aley, C. D. Woods, H. S. Boardman, delegates.

MARYLAND: A. F. Woods, H. J. Patterson, T. H. Taliaferro, T. B. Symons, F. B. Bomberger, P. W. Zimmerman, Harry Gwinner, delegates; H. B. McDonnell, P. F. Brookens, R. L. Buchanan, H. M. Conolly, W. R. Mattoon, G. P. Springer, visitors.

MASSACHUSETTS: K. L. Butterfield, W. P. Brooks, A. V. Osmun, A. D. Kilham, W. D. Hurd, H. W. Tyler, delegates; W. J. Beal, Mrs. K. L. Butterfield, Laura Comstock, Mrs. W. D. Hurd, E. L. Morgan, F. W. Rane, R. W. Stimson, F. A. Waugh, H. J. Wheeler, Wilfrid Wheeler, visitors.

MICHIGAN: F. S. Kedzie, A. M. Brown, R. S. Shaw, G. W. Bissell, W. H. French, R. J. Baldwin, delegates; Mary E. Edmonds, E. I. Dail, C. E. Bement, visitors.

MINNESOTA: R. W. Thatcher, A. D. Wilson, J. R. Allen, A. V. Storm, E. M. Freeman, Andrew Boss, Mildred Weigley, delegates; J. C. Anthony, Mrs. A. V. Storm, visitors.

MISSISSIPPI: W. H. Smith, E. R. Lloyd, delegates; R. S. Wilson, visitor.

MISSOURI: A. R. Hill, F. B. Mumford, A. J. Meyer, M. F. Miller, Louise Stanley, delegates; W. F. Cramer, Price Lane, visitors.

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MONTANA: F. B. Linfield, delegate; W. J. Rupert, visitor.

NEBRASKA: S. Avery, E. A. Burnett, C. W. Pugsley, O. V. P. Stout, delegates; Alice M. Loomis, visitor.

NEVADA: Walter E. Clark, J. G. Scrugham, C. S. Knight, C. A. Norcross, delegates.

NEW HAMPSHIRE: R. D. Hetzel, J. C. Kendall, C. E. Hewitt, Helen Knowlton, F. W. Taylor, delegates.

NEW JERSEY: W. H. S. Demarest, J. G. Lipman, A. A. Titsworth, Alva Agee, delegates.

NEW MEXICO: A. D. Crile, Fabian Garcia, W. L. Elser, delegates.

NEW YORK: W. H. Jordan, A. R. Mann, R. A. Emerson, M. C. Burritt, A. A. Johnson, Alexander Gray, G. A. Bicker, delegates; C. W. Burkett, D. J. Crosby, Graham Lusk, E. G. Montgomery, W. C. Smith, Bertha E. Titsmouth, David Robinson, G. A. Works, visitors.

NORTH CAROLINA: W. C. Riddick, B. W. Kilgore, C. B. Williams, C. R. Hudson, delegates; T. E. Browne, D. T. Gray, J. M. Gray, S. G. Rubinow, visitors.

NORTH DAKOTA: E. F. Ladd, Thomas Cooper, delegates.

OHIO: W. O. Thompson, C. E. Thorne, Alfred Vivian, E. T. Coddington, C. S. Wheeler, Edna N. White, delegates; Herbert Osborn, A. E. Waller, visitors.

OKLAHOMA: J. W. Cantwell, J. A. Wilson, M. A. Beeson, Emma A. Chandler, G. W. Vincent, delegates; C. W. Callarman, F. L. Rounsevell, visitors.

OREGON: W. J. Kerr, A. B. Cordley, G. A. Covell, delegates; O. D. Center, visitor.

PENNSYLVANIA: E. E. Sparks, R. L. Watts, R. L. Sackett, M. S. McDowell, Sara C. Lovejoy, delegates; William Frear, H. P. Armsby, E. W. Bacon, L. H. Dennis, R. W. Heine, John Hamilton, John D. Toll, John H. Washburn, visitors.

PORTO RICO: D. W. May, B. F. Andrews, delegates.

RHODE ISLAND: Howard Edwards, B. L. Hartwell, R. L. Wales, A. E. Stene, delegates.

SOUTH CAROLINA: W. M. Riggs, H. W. Barre, S. B. Earle, Edith L. Parrott, F. H. H. Calhoun, Gladys H. Smith, Mrs. Dora D. Walker, delegates; B. Breland, Wilson Gee, Verd Peterson, W. W. Long, visitors.

SOUTH DAKOTA: E. C. Perisho, G. W. Randlett, Chas. McCaffree, Inez B. Perisho, delegates.

TENNESSEE: Brown Ayres, H. A. Morgan, C. E. Ferris, C. A. Keffer, Virginia P. Moore, W. A. Schoenfeld, Louise G. Turner, Nellie Crooks, delegates; Mary B. McGowan, visitor.

TEXAS: W. B. Bizzell, B. Youngblood, E. J. Kyle, J. C. Nagle, delegates; M. L. Hayes, W. B. Lanham, visitors.

UTAH: E. G. Peterson, F. S. Harris, John T. Caine, III, G. R. Hill, Jr., L. N. Stohl, Alice Ravenhill, delegates.

VERMONT: J. L. Hills, Thos. Bradlee, Bertha M. Terrill, delegates; F. B. Jenks, visitor.

VIRGINIA: A. W. Drinkard, Jr., L. S. Randolph, J. M. Jones, J. R. Hutcheson. C. K. Graham, delegates; C. G. Burr, W. B. Elliott, H. W. Gilbertson, E. R. Hodgson, R. W. James, R. E. Marshall, R. T. Neal, C. Woolsey, visitors.

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WASHINGTON: E. O. Holland, Geo. Severance, delegates; W. S. Thornber, visitor.

WEST VIRGINIA: J. L. Coulter, C. R. Jones, C. R. Titlow, Sadie Guseman, Marion Hepworth, delegates; S. A. Cody, Rachel H. Colwell, B. B. Esell, T. O. Fling, N. T. Frame, W. H. Gill, Byrd Prillerman, F. W. Stemple, H. S. Vandervort, C. H. Winkler, W. R. Worthington, visitors.

WISCONSIN: H. L. Russell, C. P. Norgord, Emma Conley, delegates; Abby L. Marlatt, E. D. Ball, H. N. Goddard, visitors.

WYOMING: H. T. Knight, A. E. Bowman, delegates.

UNITED STATES DEPARTMENT OF AGRICULTURE: A. C. True, delegate; E. W. Allen, Mary A. Agnew, C. H. Alvord, H. W. Barber, W. H. Beal, Mrs. W. H. Beal, O. H. Benson, G. A. Billings, C. E. Chambliss, V. K. Chestnut, L. A. Clinton, C. P. Close, L. C. Corbett, Emma R. Davisson, W. H. Evans, David Fairchild, E. R. Flint, C. L. Goodrich, A. B. Graham, D. D. Green, A. F. Hawes, F. E. Heald, I. W. Hill, E. R. Hodson, W. A. Hooker, H. B. Joy, Bradford Knapp, H. L. Knight, C. E. Leighty, J. D. Luckett, J. D. McVean, O. B. Martin, W. B. Mercier, E. A. Miller, L. A. Miller, Geo. E. Murrell, E. H. Nollau, C. H. Popenoe, Helmer Rabild, R. W. Redman, G. M. Rommel, Marie Sayles, F. M. Scales, William E. Schneider, H. E. Schuman, J. I. Schulte, Frederick Schwab, C. B. Smith, Mrs. J. H. Stone, J. L. Tingle, D. W. Working, E. B. Working, P. K. Whelpton, visitors.

UNITED STATES DEPARTMENT OF THE INTERIOR: BUREAU OF EDUCATION: C. D. Jarvis, J. C. Muerman, S. P. Capen, delegates; C. L. Strome, W. T. Bawden, visitors.

CANADA: G. C. Creelman, J. H. Grisdale, W. J. Black, C. A. Zavitz, visitors.

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Constitution

NAME

This Association shall be called the Association of American Agricultural Colleges and Experiment Stations.

OBJECT

The object of this Association shall be the consideration and discussion of all questions pertaining to the successful progress and administration of the colleges and stations included in the Association, and to secure to that end mutual cooperation.

MEMBERSHIP

(1) Every college established under the act of Congress approved July 2, 1862, or receiving the benefits of the act of Congress approved August 30, 1890, and every agricultural experiment station established under state or congressional authority, the Bureau of Education of the Department of the Interior, the Department of Agriculture, and the Office of Experiment Stations of the last named Department shall be eligible to membership in this Association.

(2) Any institution a member of the Association in full standing may send any number of delegates to the meetings of the Association. The same delegate may represent both a college and a station, but shall vote in only one section, and shall cast only one vote in general sessions. Other delegates may be designated by an institution to represent it in specified divisions of the sections of the Association, but such delegates shall vote only in such divisions and no institution shall be allowed more than one vote in any sectional meeting.

(3) Delegates from other institutions engaged in educational or experimental work in the interest of agriculture or mechanic arts may, by a majority vote, be admitted to conventions of the Association with all privileges except the right to vote.

(4) In like manner, any person engaged or directly interested in agriculture or mechanic arts who shall attend any convention of this Association may be admitted to similar privileges.

SECTIONS

(1) The Association shall be divided into three sections: (*a*) a section on college work and administration, (*b*) a section on experiment station work, (*c*) a section on extension work, composed of directors or superintendents of extension departments in the institutions in this Association, or the representatives of such departments duly and specifically accredited to this section.

The section on college work and administration shall be composed of the presidents or acting presidents of colleges and universities represented in the Association, or other representatives of such institutions duly and specifically accredited to this section, and no action on public and administrative questions shall be final without the assent of this section.

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The section on experiment station work shall be composed of the directors or acting directors of experiment stations represented in the Association, or of other representatives of such stations duly and specifically accredited to this section.

(2) Members of these three sections (and no others) shall be entitled to vote both in general sessions and in the section to which they respectively belong.

The representative appointed by the United States Bureau of Education shall be assigned to the section on college work and administration; the representative of the Office of Experiment Station to the section on experiment station work; and the representative of the United States Department of Agriculture to either section as he may elect and the section by vote authorize; but such election once made and authorized may not be changed during the sessions of a given convention.

Each section may create such divisions as it may from time to time find desirable, and shall elect its own chairman and secretary for sectional meetings, whose names shall be reported to the Association for record.

(3) Each section shall conduct its own proceedings, and shall keep a record of the same, and no action of a section, by resolution or otherwise, shall be valid until the same shall have been ratified by the Association in general session, and, in the case provided for in the foregoing paragraph, (1) shall also have been approved by the section on college work and administration.

MEETINGS

(1) This Association shall hold at least one meeting in every calendar year, to be designated as the annual convention of the Association. Special meetings may be held at other times, upon the call of the Executive Committee, for purposes to be specified in the call.

(2) The annual convention of the Association shall comprise general sessions and meetings of the sections, and provision shall be made therefor in the program. Unless otherwise determined by vote, the Association will meet in general session in the forenoons and evenings of the convention and the sections in the afternoons.

OFFICERS

(1) The general officers of this Association, to be chosen annually, shall be a president, five vice-presidents, a bibliographer, and a secretary, who shall also be treasurer, and an Executive Committee of five members, three of whom shall be chosen by the section on college work and administration and two by the section on experiment station work; *provided*, however, that a member chosen by either section need not be a member of that section. The Executive Committee shall choose its own chairman.

(2) Each section shall, by ballot, nominate to the Association in general session for its action a chairman and a secretary for such section.

(3) The president, vice-president, secretary and bibliographer of this Association shall be elected by ballot upon nomination made upon the floor of the convention, and shall hold office from the close of the convention at which they are elected until their successors shall be chosen.

(4) Any person being an accredited delegate to an annual meeting of the Association, or an officer of an institution which is a member of the Association in full standing at the time of election, shall be eligible to office.

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DUTIES OF OFFICERS

(1) The officers of the Association shall perform the duties which usually devolve upon their respective offices.

(2) The president shall deliver an address at the annual convention before the Association in general session.

(3) The Executive Committee shall determine the time and place of the annual conventions and other meetings of the Association, and shall between such conventions and meetings act for the Association in all matters of business. It shall issue its call for the annual conventions of the Association not less than sixty days before the date on which they are to be held, and for special meetings not less than ten days before such date. It shall be charged with the general arrangements and conduct of all meetings called by it. It shall designate the time and place of the convention. It shall present a well-prepared order of business, of subjects for discussion, and shall provide and arrange for the meetings of the several sections. The subjects provided for consideration by each section at any convention of the Association shall concentrate the deliberations of the sections upon not more than two lines of discussion, which lines, as far as possible, shall be related. Not more than one-third of the working time of any annual convention of the Association shall be confined to miscellaneous business.

FINANCES

At every annual convention the Association in general session shall provide for obtaining the funds necessary for its legitimate expenses and may, by appropriate action, call for contributions upon the several institutions eligible to membership; and no institution shall be entitled to representation or participation in the benefits of the Association unless such institution shall have made the designated contribution for the year previous to that in and for which such question of privilege shall rise, or shall have said payment remitted by the unanimous vote of the Executive Committee.

AMENDMENTS

This constitution may be amended at any regular convention of the Association by a two-thirds vote of the delegates present, if the number constitute a quorum; *provided,* that notice of any proposed amendment, together with the full text thereof and the name of the mover, shall have been given at the next preceding annual convention and repeated in the call for the convention. Every such proposition of amendment shall be subject to modification or amendment in the same manner as other propositions, and the final vote on the adoption or rejection shall be taken by yeas and nays of the institutions then and there represented.

RULES OF ORDER

(1) The Executive Committee shall be charged with the order of business subject to special action of the convention, and this committee may report at any time.

(2) All business or topics proposed for discussion and all resolutions submitted for consideration of the convention shall be read and then referred, without debate, to the Executive Committee to be assigned positions on the program.

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(3) Speakers invited to open discussion shall be entitled to twenty minutes each.

(4) In general discussions the ten-minute rule shall be enforced.

(5) No speaker shall be recognized a second time on any one subject while any delegate who has not spoken desires to do so.

(6) The hours of meeting and adjournment adopted with the general program shall be closely observed, unless changed by a two-thirds vote of the delegates present.

(7) The presiding officer shall enforce the parliamentary rules usual in such assemblies and not inconsistent with the foregoing.

(8) Vacancies which may arise in the membership of standing committees by death, resignation, or separation from the Association of members shall be filled by the committees respectively.

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Proceedings of the Thirty-First Annual Convention of the Association of American Agricultural Colleges and Experiment Stations

MINUTES OF THE GENERAL SESSIONS

MORNING SESSION, WEDNESDAY, NOVEMBER 14, 1917

The Convention was called to order at 9.30 A. M. at the New Willard Hotel, Washington, D. C., by the president, President K. L. Butterfield of the Massachusetts Agricultural College.

Prayer was offered by President A. D. Crile of the New Mexico College of Agriculture and Mechanic Arts.

THE PRESIDENT. The Chair knows of no parliamentary order that gives it the right to bring up a question of personal privilege, but its occupant wishes to state at the outset that he feels that in one sense he is here under false pretenses. The fact of his presence came about presumedly because it was expected that the Association would be the guests of the Massachusetts Agricultural College in October. For reasons that hardly need explanation, the plans for the celebration of the fiftieth anniversary of the college reluctantly were given up and necessarily the Association changed its plans. We had looked forward not only to our celebration but to the opportunity of greeting you as our guests. We hope that the day is not far distant when this postponed celebration may be held and that we may then welcome you.

Unless there is objection the Secretary will make out the roll of the convention from registration cards and credentials.

The first order of business is the report of the Executive Committee, which will be submitted by its chairman, President W. O. Thompson of the Ohio State University.

W. O. THOMPSON. Mr. President, the Executive Committee has no written report to present at this moment but will present such from time to time.

THE PRESIDENT. The report of the treasurer will be submitted by Dean J. L. Hills of the University of Vermont.

REPORT OF THE TREASURER

November 15, 1916 to November 14, 1917

RECEIPTS

To balance on hand, Washington meeting	$ 123 93
To 50 dues from colleges at $35	1,750 00
To 50 dues from stations at $20	1,000 00
To refund by Massachusetts Agricultural College on account of Graduate School of Agriculture	30 23
To certificate of deposit for $1,000 of February 18, 1916, with 15 months' interest	1,050 89
Total receipts	$3,955 05
Disbursements as per statement	3,281 98
Balance on hand November 14, 1917	$ 673 07

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DISBURSEMENTS

Executive committee	$ 783 26
Joint committee on publication of research	663 17
Secretary-treasurer	37 88
Proceedings thirtieth convention (printing, stenographic service, editing, expressage, postage, badges, placards, etc.)	1,797 67
Total disbursements	$3,281 98

ASSETS

Cash on hand, November 14, 1917	$ 673 07
Certificate of deposit (City Trust Co., January 24, 1916)	3,000 00
Twenty-two months' interest at 4% on $3,000 (Nov. 24)	220 00
Total assets	$3,893 07

On motion, the report of the treasurer was referred to an auditing committee consisting of President W. J. Kerr of the Oregon Agricultural College and Dean Alfred Vivian of the Ohio State University, which, later, reported as follows:

REPORT OF AUDITING COMMITTEE

The auditing committee has examined the accounts of the treasurer and found the same to be correct. It finds all vouchers properly receipted and on file. It also finds a bank balance as stated of $673.07, and finds in the treasurer's hands a certificate of deposit for $3,000, dated January 24, 1916, bearing simple interest at the rate of four percent per annum.

W. J. KERR,
ALFRED VIVIAN,
Auditing Committee.

On motion, the report of the auditing committee was received and adopted.

THE PRESIDENT. The report of the committee on graduate study will now be presented by its chairman, Director H. P. Armsby of the Pennsylvania State College.

REPORT OF THE COMMITTEE ON GRADUATE STUDY

In its report to the Convention of 1916 your committee called attention to the decline in the attendance upon the Graduate Summer School of Agriculture at its more recent sessions and attempted to indicate some of the probable causes of this decline. It did not at that time, however, feel prepared to make any specific recommendations concerning the future policy of the Association as regards the school, but did recommend that the session which in the ordinary course would have been held in the summer of 1918 be postponed for a year.

Since that time the situation has been radically changed by the entry of the United States into the war. Large numbers of the faculties of the institutions from which the instructors for the summer must be chiefly drawn are engaged in war activities of one sort or another, while the ranks of the potential student have been decimated by voluntary enlistment and

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by the operation of the so-called "selective" draft. It seems very doubtful, therefore, whether a successful session upon the old plan could be held under existing conditions.

On the other hand this does not seem an opportune time for any radical change of policy. The committee has considered at some length several suggestions as to means by which the Association might promote graduate study and research in agriculture. It fully recognizes the importance of that object. The net result of its discussions, however, has been to impress upon it the impossibility of forecasting either the needs or the possibilities of the immediate future and in particular of the post-bellum period. Under existing conditions, the committee believes a waiting policy to be the part of wisdom. It, therefore, recommends that the subject be again postponed and that no steps be taken towards holding another session of the Graduate Summer School prior to the next convention of the Association.

Respectfully submitted for the committee,

H. P. Armsby, *Chairman.*

On motion, the report of the committee on graduate study was received.

The President. The report of the committee on instruction in agriculture will now be presented by its chairman, Director A. C. True of the States Relations Service of the Federal Department of Agriculture.

Report of Committee on Instruction in Agriculture

Immediately following the 1916 meeting of the Association, the committee decided that during the ensuing year it would make a study of "College Teaching in Agriculture with Particular Reference to the Improvement of Methods," with a view of making some recommendations to the Association at this Convention.

Steps were promptly taken to carry out the contemplated plan and, after considerable correspondence between members of the committee as to the nature and scope of the investigation, it was agreed that as in former years, Professor D. J. Crosby of Cornell University would be asked to collect the necessary data, visit such institutions as were found definitely to be considering measures for improving the quality of their teaching and assist in preparing the report. In accordance with this plan, the chairman of the committee sent questionnaires to the executive officers of the Colleges of Agriculture, many of whom expressed great interest in the investigation and took pains to compile full and accurate data.

By the first of April fully one-third of the institutions had sent in their replies to the questionnaire and everything looked favorable to the securing of much valuable material for the use of the committee. Then came the declaration of war. Immediately the work of all of the Agricultural Colleges was to a large extent changed. Students and members of faculties were volunteering or were taking up emergency agricultural work. It soon became apparent that there would be no further opportunity for studying the methods of teaching in these institutions under conditions anything like normal ones. Upon the advice of the chairman of the committee, supported by the opinions of other members, Mr. Crosby gave up the work on the report for this year.

The committee, therefore, has no report to offer, except to urge that

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now more than ever before it is important that careful attention be given to measures for improving the quality of the teaching.

The committee considers such measures urgent at this time because of the greater relative burden laid upon agriculture since the declaration of war. Agriculture has always been important, but it has never before occupied a place of such relative prominence in the eyes of all the people. In this country and abroad, agriculture is now recognized to be of importance second only to the military service, even under war conditions. On this account there is a heavier burden of responsibility upon the young men of our Agricultural Colleges—students and graduates alike—who have not been called to military service. The burden is greater not only because of the demand for greater production, but also because of the smaller number of young men available for positions as teachers, as specialists and as organizers in field demonstration work. It is, therefore, highly important that the agricultural college students who are not yet subject to the draft, as well as those who have been excused from military service, remain in college and make the best of every opportunity to prepare themselves for these heavier burdens, and it is incumbent upon the Colleges of Agriculture not only to urge this point of view but to provide for these young men the best teaching and the most thorough training.

Attention to measures for improving the methods of teaching are also relatively important at this time because of the increased demand for trained teachers of agriculture, due to the enactment of the Smith-Hughes Vocational Education Bill. The new work in schools below college grade, growing out of the federal aid given by the Smith-Hughes Act, will create a demand for several hundred teachers of agriculture with training equivalent to graduation from an agricultural college. In the few States that have been giving financial aid to schools employing trained teachers of agriculture, there were at the beginning of the war upwards of a thousand trained young men in such schools. This teaching force has been greatly depleted as a result of voluntary enlistment and of the military draft, with the result that even now it is apparent that some school authorities have been forced to accept lower standards of training than were formerly required of teachers of agriculture. This is a condition that imposes a heavy burden upon our institutions to counteract and it is doubtful whether they will be able fully to counteract it. It is hardly to be expected that they can immediately fill the places of those who have gone into military service with other fully trained young men, but they can do much to prevent the serious lowering of standards by increasing their facilities for training undergraduates for the teaching profession, by conducting emergency courses for teachers now in service and by the intensive training along agricultural lines of college graduates in arts and science courses.

The committee is also of the opinion that not within a decade has there been a time so favorable for giving serious attention to measures for improving the quality of teaching in the colleges themselves as the present war emergency affords. During the past 15 or 20 years nearly every agricultural college in the country has been working at high pressure. Nearly all of them have been growing more rapidly in enrollment than in teaching staff and equipment. The result has been crowded classrooms, large laboratory sections, many hours in class and laboratory for teachers with correspondingly few hours for preparation, and too much of a tendency to get things done somehow, whether well done or not. Just now

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there seems to be a breathing spell so far as the resident teaching work is concerned. There are probably 30 percent less students than last year; the classrooms are less crowded; the sections are smaller and the number of students each instructor is required to teach has in many cases decreased. The present time seems, therefore, to be opportune to consider how we have been doing things and how we may do them to better advantage.

In this self-examination, as well as in the work of preparing teachers of agriculture for the public schools, strong departments of agricultural education are almost indispensable. Where such departments are now maintained it has been found that they exert a very wholesome influence upon the college courses offered. They usually hold memberships on important faculty committees dealing with educational policy, and in some of the colleges they have been asked to study the work done by other departments and to offer suggestions for improvement in methods of teaching. Sometimes, also, the students who have had work in these departments and have thus acquired high ideals of what constitutes good teaching, bring indirect influence to bear upon other departments to improve the quality of their teaching.

In the teaching of agriculture there are three aspects that should be kept constantly in view—the practical, the scientific and the professional. Most of the instructors in the agricultural colleges have been well prepared in the practical and scientific phases of agriculture, but no particular attention has been paid to their professional training. Almost any bright young man, a graduate of an agricultural college, could get a position as instructor in an agricultural college or would be recommended for a teaching position in a secondary school. A fair proportion of these young graduates have done well as teachers, but they have succeeded in spite of the lack of professional training. The percentage and degree of successes might have been much larger if the professional training had been provided. No matter how well manned and equipped the subject-matter departments of the Colleges of Agriculture may be, they need the help of strong departments of agricultural education, not only in the training of undergraduates for teaching positions but also in improving the quality of teaching within the subject-matter departments.

On the other hand, departments of education that are charged with teaching methods in agriculture, unless closely associated with strong subject-matter departments in agriculture, are apt to stress the professional phases and lose sight of the scientific and the practical. They need and their students need to be close to the sources of inspiration, close to the men who are teaching agriculture. In other words, it will not be a good thing for students who are preparing to teach agriculture to get their scientific and practical training in one institution and their training in methods of teaching in another, to get agriculture in a college of agriculture and teaching methods in agriculture in an arts college or a normal school.

Strong departments of agricultural education will be needed under the administration of the Smith-Hughes Act in order to give the Colleges of Agriculture the position they should occupy in the training of teachers of agriculture. Unless these colleges take up the teacher-training work actively at the present time, the funds provided for this work under the Smith-Hughes Act are likely in many States to be divided among a number of institutions, including some of relatively low grade and poor equipment,

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with the result that our whole system for training teachers of agriculture will be fundamentally weak. Our institutions ought to possess a clear leadership in this field and they cannot secure this unless they adequately equip their departments of agricultural education.

Briefly, then, the committee would recommend that immediate and serious attention be given to means for improving the quality of teaching in college courses in agriculture, and, as one of the means to that end, it would urge the development of strong departments of agricultural education.

A. C. TRUE,
J. F. DUGGAR,
T. F. HUNT,
A. C. MONAHAN,
A. V. STORM,
H. J. WATERS,
Committee.

On motion, the report of the committee on instruction in agriculture was received.

A. C. TRUE. The Association has usually printed separates of the report of this committee in advance of the issuance of the Proceedings. In this instance the report is so short that I will undertake to have mimeographed copies prepared and sent to the different institutions throughout the country.

THE PRESIDENT. The report of the bibliographer will now be offered by Director A. C. True.

REPORT OF THE BIBLIOGRAPHER, 1917

AGRICULTURAL LITERATURE AND THE WAR

In November, 1916, an editorial appeared in the Experiment Station Record showing the changes effected by the war in the work of agricultural institutions and in the character and quantity of foreign scientific literature. The year that has since elapsed has not materially altered the situation, whose main features are briefly summarized in the following extracts.[1]

"The standard journals come less frequently and some have been suspended. Many of the research articles now published relate to work done prior to the war, rather than current investigation; and summaries of old work are common, to point out the practical application of the results. The more strictly scientific publications . . . . show a much reduced size. . . . . Nearly all the Belgian literature has ceased entirely. . . . The agricultural literature from France has considerably diminished. Practically no scientific literature has been received from Germany since June, 1916. . . . The Italian literature shows less variation from the previous subject-matter than does the French, German and English."

As far as conditions in the United States are concerned, the chief developments of the past year have been an increased uncertainty in the receipt of scientific literature from Europe and an increased use of review journals published in England and in the United States in those sciences in which German bibliographical work was formerly our chief reliance.

[1] Exp. Sta. Rec. 35, 7, p. 608 (1916).

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When the above quoted statement was made, there seemed reason to hope that more, rather than fewer, of the German scientific periodicals might reach this country. Through occasional reviews in such organs as those published by the International Institute of Agriculture in Rome, it was known that at least some of these still continued publication in Germany. Our entry into the war, however, has put an end to all expectation that any exchanges may come through and has rendered subscriptions impossible. Difficulties of transportation have added to the uncertainty of obtaining in this country an adequate representation of the material actually published in Europe. The Smithsonian Exchange service, through which many of the publications of European scientific societies reach this country, suspended shipments in 1914 but resumed them after a few months and has recently received consignments from most of the principal countries of Europe except Germany, Austria-Hungary and Russia. Of course the quantity and frequency of these receipts are much diminished.

Before war conditions made this impossible, German scientific review journals could be counted on to cover the current world literature of their special subjects in minute and thorough fashion, but while the final numbers that reached this country in 1916 were valuable as a guide to German publications, it was clear that even should they continue to come they could no longer be depended on to cover the larger field. By the absence of these accustomed guides and by their inability to maintain the former standard, the production and use of similar reviews published in the United States and in England have been greatly stimulated. "Chemical Abstracts," for example, has attained a place even more important than before, while "Abstracts of Bacteriology" and "Physiological Abstracts" have made auspicious beginnings. The absence of the former accustomed channels for publication has undoubtedly also contributed to the success of a number of scientific journals recently inaugurated for the publication of original work in the United States and in England. In the United States the literature of scientific investigation and research bearing upon agriculture has shown considerable increase.

While the effect of the war upon the scientific literature of agriculture is important, yet the vitally significant change in agricultural printing has been in the creation of a mass of popular "emergency" literature of a comparatively new sort, exhortation and precept cast into pictorial, mimeographed or printed form, bulletins, posters, circular letters and what not, as seemed best calculated at the moment to arrest attention and provoke immediate action. That such methods have been used in other countries as well as our own may be inferred from some fragments that have reached us. Existing institutions have adopted or intensified emergency methods of presenting facts or advice concerning food production and conservation. State councils of defense and public safety committees have joined in the work and many local organizations which have sprung into existence for the purpose of passing on the message have not failed to contribute their typographical bit to the good cause. The daily press, too, has never before been used to so great an extent in spreading information on food production and conservation.

Fortunately the moment of the entrance of the United States into the war found this country provided with a machinery organized under the Smith-Lever Act which was prepared to transmit the agricultural message in an authoritative way through responsible agents to the man and woman

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in the field and in the home. Very extensive use has been made of the services of county agricultural and home demonstration agents in producing unity and timeliness of action throughout the land. Extensive as they are printed matter and multigraphed material, whether issued by the colleges and stations, state or county councils of defense or other organisations, indicate, rather than reveal, the varied and far extending activities of the colleges and stations and their agents in safeguarding and guiding the country in the national emergency.

To form a complete collection of all the material of this kind that has been issued since the United States entered the war would be almost impossible and an effort to make such a collection complete would hardly serve a useful purpose other than that of future historical interest. Yet no one who has had occasion to observe recent emergency literature of food production and conservation in however limited a way can fail to be impressed with its endless variety in form of presentation and its endless repetition of subject-matter. Both the variety and repetition have been a necessary outcome of the imperative need that has existed for vividness of presentation and haste in distribution in order to secure the desired result of prompt action. Thus far, there has been time only to seise upon any promising medium without weighing the effectiveness of one form against another. Nor has there been time to examine what one's neighbors had done or were doing with a view to avoiding unnecessary undertakings. The situation has in fact demanded a certain measure of duplication.

It is, of course, inevitable that, issued in haste and distributed broadcast from different sources, some of this literature should have proved ineffective for its purpose, that its very volume has been bewildering, and that there have been contradictory statements and ill-considered appeals which have produced confusion or resentment instead of enlightenment and inspiration. The situation fortunately no longer justifies the same degree of duplication of effort or breathless haste of issue and distribution. It is now possible to foresee for a sufficiently extended period the subjects which will claim attention and, therefore, it will be possible carefully and thoughtfully to plan for the advantageous use of existing and available material as well as for the preparation of such new matter as may be needed. The variety in form and subject of what has been issued gives ample opportunity for mature and well considered selection of suitable forms of presentation and will be valuable as a guide to the formulation of more definite principles by which future activities may be guided.

On motion, the report of the bibliographer was received.

THE PRESIDENT. The report of the committee of the Agricultural Librarians' Section of the American Library Association is now in order. (In this connection, see pages 159 and 161).

REPORT OF A COMMITTEE OF THE AGRICULTURAL LIBRARIES' SECTION OF THE AMERICAN LIBRARY ASSOCIATION

At a meeting of the Agricultural Libraries' Section of the American Library Association held at Louisville, June 26, 1917, a committee was appointed to prepare a report on certain matters and to submit the same to the Association of American Agricultural Colleges and Experiment Sta-

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tions at its next annual meeting. This committee does not regard itself as representing an alien organization but as one that might quite properly be affiliated with this Association rather than with the Library Association in view of the fact that its members are for the most part the librarians of the state agricultural colleges and experiment stations. Hence in making the following report the committee feels that it is voicing the opinions of the librarians of these institutions.

Your Association has in previous years considered matters relating to station publications as viewed from the standpoint of librarians, and although little fault was found with their recommendations, not much progress has as yet been made along the lines they have suggested. This, we believe, is due largely to the fact that no committee was appointed to give these matters continuous attention. Whatever action may or may not be taken at the present session of this Association with reference to our recommendations, we hope that a committee of this Association may be appointed to take these matters under advisement, to cooperate with representatives of the libraries, to report regularly to the Association and to continue its efforts until at least a majority of the stations and extension divisions give serious attention to library matters and reach more or less uniformity in the matter of their publications and their distribution.

The subjects on which the present committee were asked to approach the Association are as follows:

1. More general and regular distribution of station and extension publications to libraries. The publications of the stations have not been considered in the past as of great value to the public library; but now, owing to increased interest on the part of the public in scientific and industrial subjects, this attitude has been radically changed. A still greater interest will be shown in the years to come, stimulated to some extent by the issuance of the *Agricultural Index*, a publication begun in 1916 through the efforts of the Agricultural Libraries' Section of the American Library Association. This publication receives a large part of its support from the purely agricultural libraries, but it is also securing an increasingly large number of subscriptions from among the public libraries. This publication indexes practically all station and many extension bulletins and circulars. In time all issues of this type will be included within its scope. The result will be an increasingly large number of requests from libraries for given numbers and titles as well as requests to be placed on permanent mailing lists. It is felt that stations should recognize the legitimacy of such demands and arrange to meet them. All libraries within the home state, properly organized to preserve and make use of them, should receive all station and extension publications. The wastage in such distribution would be no greater than in any other group of the same size, and as the libraries become better educated as to the value of this literature it would become negligible. A station owes it to the citizens of its State to see to it that the libraries, the natural distributors and preservers of literature, are supplied with its publications.

Great liberality should be exercised in placing on the permanent mailing lists the libraries beyond state borders requesting the privilege. This extension of service to libraries should not be regarded as an added burden placed upon an already overcrowded mailing list, but as a contribution to the permanent preservation of scientific data in places where it is readily

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available to a large body of citizens, and, also, as a step likely in the long run to result in considerable saving from the lessening of individual requests. Some stations are now accustomed to refer inquirers to their local libraries. We are aware that many station and extension publications are issued for purposes other than as records of scientific work; but it is from that point only that they are here considered.

The committee, therefore, wishes to recommend that all station and extension publications be sent to all libraries of the home state and to all other libraries requesting them, that separate mailing lists of libraries be maintained, and that provision be made in all cases for the prompt supply of all publications to the libraries on these lists.

2. The maintenance of reserve supplies of each publication. In answering inquiries on this point several stations stated that they considered that all copies in excess of those required by the permanent mailing lists constituted a reserve supply. This is not quite what is meant. It frequently happens in the case of popular publications that tens of thousands are distributed promptly, whereas some libraries fail to receive their quota and on inquiry find that the supply has become exhausted. Then, too, copies are sometimes lost or damaged in transit, or a back number is missing from a library's files when the time comes to bind a volume. Sometimes requests are received from foreign countries many months after publication. To take care of these and other extraordinary and largely unforseen demands, a small reserve of at least 150 copies of every publication should be retained to be drawn upon at the discretion of the director and the librarian when the main supply has become exhausted. Each request would then be considered on its merits, the requests of scientific workers and libraries taking precedence. If, at any time, this reserve should become reduced to 25 copies, still greater care should be exercised in the distribution. Some such practice is now in vogue in several stations and should be more generally accepted.

The committee, therefore, recommends that stations and extension divisions be requested to maintain reserve supplies of each publication of at least 150 copies and make regulations concerning their distribution.

3. The sale of station publications. The committee is not at present prepared to make any definite recommendation touching the advisability of placing a nominal price upon station publications under certain conditions. Apparently the law in some States does not permit it, while in others it may be and is now being done. The success of the practice as adopted by the Federal Department of Agriculture surely makes it worthy of consideration by the experiment stations and even by the extension divisions. It would be done only when publications are requested in quantity, when the supply has been reduced below a certain point or when requests are made by those not normally entitled to receive them free of charge. We believe that some such plan would go a long way toward correcting and preventing some of the waste necessarily incident to the present methods of distribution and that it is worthy of consideration and study by a committee of this Association.

Respectfully submitted,

W. M. Hepburn, *Chairman*,
C. R. Green,
M. G. Wyer,
Committee.

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THE PRESIDENT. I have now the pleasure of presenting to the Association the Honorable Secretary of Agriculture.

ADDRESS OF D. F. HOUSTON, SECRETARY OF AGRICULTURE

By reason of the persistent kindness and good will of this Association, the custom of having the Secretary of Agriculture appear before it has become almost as fixed and compelling as a custom of the Constitution. I hope that the custom will not grow stale or be changed, at least so long as I occupy the Federal office. It is always a privilege and an inspiration to meet the members of this body. My only regret is that I am able to be present at your meetings so short a time and that I have so little opportunity to meet the members individually.

According to the calendar, it is almost a year to the day since my last meeting with you. Judged by the experiences through which we have passed, it seems more like a generation. Then this country was at peace, though its patience was being sorely tried. Now it is at war for reasons which I need not discuss before this body. It had no alternative. It either had to fight or to admit that it had no honor, was not a free Nation, and would henceforth be subjected to a medieval power that in the last analysis knows no law but might. The Nation was living on a peace basis and had organized itself accordingly. It was not fully prepared for war in any respect; but it was fortunately circumstanced in the character of its agricultural organization and the number and efficiency of its expert agencies. In fact, in efficient machinery for directing agricultural activity, as represented by the Land-Grant Colleges, the Federal Department of Agriculture, farmers' organizations, and its alert and patriotic rural population, it excelled any other two or three nations in the world combined. The Nation may well pride itself on the fact that it had had the foresight generations ago to lay deep its agricultural foundations. I congratulate the representatives of the Land-Grant Colleges on the fine opportunity for service presented to them and on the splendid way in which they have seized it. The Department of Agriculture has had great comfort in the thought that these institutions, ably planned and wisely directed, existed in every part of the Nation and stood ready not only to place themselves at the service of the National Government but also to take the initiative in a vast number of directions.

When a state of war was declared on April 6, the food situation was unsatisfactory. The need of action was urgent and the appeal for direction was insistent. The Nation looked for guidance primarily to the Federal Department and to the state agencies which it had so liberally supported for many generations. It was not disappointed. In a two-days session at St. Louis, the trained agricultural officers of the country conceived and devised a program of legislation, organization and practice, the essential features of which have not been successfully questioned and the substantial part of which have been enacted into law and set in operation. This great Democracy revealed its inherent strength. Initiative was not wanting in any part of the Union. Effective organization quickly sprang up in all the States and the services of experts everywhere immediately were made available. The response of the farmers was prompt and energetic and the results are that crop yields have been abnormally large and the Nation is able not only to feed itself but in considerable measure to supply the needs of those with whom we are cooperating.

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Of course there were delays. The process of legislation was unconscionably prolonged; but, in the end, action was generous and helpful. There have been confusions also—confusions of agencies, and, to some extent, of purpose. New forces have been set in operation suddenly and new machinery created. As time passed, better adjustments have been effected and in the future more complete coordination will undoubtedly be secured.

To the normal forces of the Government dealing with agriculture and rural problems, there has been added an emergency agency with great and unusual powers, with enormous possibilities for good, and with a remarkable record of achievements already to its credit. It has enlisted in its ranks men of wide experience, fine spirit, and high ideals, many of whom are gladly volunteering their services for the common cause. I refer to the Food Administration under the direction of Mr. Hoover.

The relation between this agency and the other organized agricultural forces of the Nation is intimate and fundamental. It is impossible completely to disassociate them, and it would be undesirable to do so. The problem in part is a common one; and it is of the first importance that the work be done in the closest cooperation and with an eye single for the public good. There is no need for undue duplication of effort and no causes of friction which can not be removed through an intelligent conception by each agency of the powers and purposes of all and by a spirit of mutual accommodation. In a broad way, it is agreed that the prime function of the Department of Agriculture shall be the stimulation of production, the conservation of products on the farm through all the normal and approved processes, the promotion of better marketing and distribution of products from the farms to the markets, the prosecution of the work in home economics along usual lines, the dissemination of information, and the extension of all these activities as authorized by law. In a similar way, the principal function of the Food Administration is the control and regulation of commercial distribution of foods, that is, of products which have reached the markets, are in the channels of distribution or in the hands of consumers, their conservation by consumers, the elimination of waste, and the handling of foods and feeds in the market by legal means through its regular officials as well as through its volunteer agencies. In the main, the Department of Agriculture deals with all the processes of farming up to the time products reach the market, until they are in the requisite form for consumption and are available for the purpose. At this point the Food Administration enters and exercises its wide powers of regulation, direction and suggestion. Where the Food Administration through its powers can be of assistance to the Department of Agriculture in its field, it is at liberty freely to make suggestion, and, when necessary, to cooperate in execution; and the same relation obtains as to the Department's participation in food administration matters in which it has a vital interest and towards the promotion of which it can be of assistance. This is the substance of the agreement originally entered into between the Food Administration and the Department of Agriculture and will be more satisfactorily observed as the agents and divisions of the two Departments familiarize themselves more fully with their tasks and with the prescribed lines of effort.

Obviously, the making of a program for the agricultural activities of the Nation did not end with the St. Louis conference. Thought, action

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and cooperation between the members of this Association and other state agencies on the one hand and the Federal Department on the other have been continuous. Attention has been given without cessation to problems in the field of labor. It was obvious that difficulties would be presented and that apprehension would run beyond the actual condition. An army could not be raised without taking men from every field of activity; and it would have been unfair to any class of workers in the community to have proposed its exemption. It was impossible in the haste of the first draft satisfactorily to work out in detail the principle of selective service; to the necessity of retaining skilled farmers and expert agricultural leaders on the farms and ranches and in the educational and administrative services. No less a burden in certain sections was imposed by the redirection of industry and the large calls made for skilled labor in essential manufacturing enterprises.

The problem confronting us in this field was not and is not an easy one. To its solution the Department of Labor, the Department of Agriculture, and many state agencies are giving constant thought. The Department of Agriculture has placed in each State an officer whose sole duty it is to assist in the mobilization of labor in the rural districts, in the distribution of it from places where it is not temporarily employed to places where it is urgently needed, in the fuller utilization of forms of labor not heretofore fully employed, and in securing more perfect cooperation among farmers in the same district. The Department of Labor has undertaken to make available not only for industrial but also for rural undertakings urban labor which is at the time disengaged. The problem is one for constructive handling. I am confident that, with the assistance of all the organized agencies and the alert and cooperative action of the farmers of the Nation, the situation can be met and that those remaining on the farms can produce as much or more than has heretofore been available. This is the aim before us and it must be attained.

The pressing problems of the spring season were scarcely out of the way before the program for the approaching fall was taken under consideration. The question presented was how to get ready for the immediate future and for the ensuing year. A committee of experts was appointed in the Department to make suggestions for future action, especially with reference to winter wheat planting. The matter was considered from every angle. After a tentative conclusion was reached regarding wheat and rye, it was transmitted to the experts of the different States for criticism and suggestion, and, as a result, it was finally determined to propose the planting of 47,337,000 acres of winter wheat and 5,131,000 acres of rye. The proposals were then brought to the attention of the grain farmers and five conferences were held in different sections of the country. A campaign to make the proposals effective was then entered upon. The actual results cannot be determined at this time, but early reports indicate that farmers intended to increase their wheat acreage by ten and rye by three percent, and those received later are to the effect that there has been an increase in nearly every State of the Union.

In somewhat similar manner the highly important problem of increasing the number of livestock of all kinds and of insuring a very much greater supply of meats and fats was promptly attacked. Conferences were held with experts and leading stockmen of the Nation and the lines of action suggested are being vigorously followed.

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I shall not offend you by attempting to impress upon you the need of continued effort to increase production and to promote conservation and economy. There must be no breakdown on the farms—no failure of foods, feedstuffs and clothing. The duty is pressing of furnishing abundant supplies for our own people, and, in large measure, for the peoples with whom we are associated in this war. The necessity of increasing production and of saving is no less important in all other directions. A nation pays for a war as it proceeds. Whether it acquires control of the wealth through taxes or through loans, it nevertheless meets the burden at the time, and the extent of the burden it can bear, if it is not to retrogress, is measured in the main by its savings. The fact that part of the people instead of all the people temporarily directly bear the burden makes no essential difference in the argument. There is sufficient justification for securing control of wealth in part through loans rather than entirely through taxation, but the fact remains that the burden is borne by the Nation as a whole at the time. It is not transferred to future generations. An obligation merely is incurred by all the people subsequently to reimburse those whose means were placed at the disposal of the Nation. Two things, therefore, are of the utmost importance—to bend every effort to increase production and to be equally alert and efficient in effecting savings.

Let us then continue our efforts with unabated zeal. I am confident that we shall not fail to receive the necessary support. No estimates have been made as yet for the continuance of the operations carried on under the Food Production Act. It has seemed wiser to await developments. If the war lasts and it appears desirable to continue the emergency activities, estimates will be submitted in ample season and I have no doubt that the Congress will make available such appropriations as the circumstances may require.

This struggle is one which calls not only for enormous resources but also for invincible determination and endurance. It is a test even more of the spirit than of physical strength. That we have the physical resources in larger measure than any other nation in the world is a matter of common knowledge. We do not yet fully realize the enormous power of the Nation. If in the Sixties, when we were a simple, crude, undeveloped Nation, doing things, relatively speaking, on an "ox-cart" basis, with the question yet undetermined whether we were to be one nation or two, we could wage the mightiest war up to that time and issue from it with unrivalled power, what can we not do today, with a united people and with immeasurably greater resources, if our spirit is right and our purpose is steadfast? Unless the descendants of the men who followed Grant and Lee are degenerate there can be no question of the ultimate outcome. It is time for each individual to search his heart and to purge his mind and purpose of unselfish motives. I can conceive that each individual, no matter what class in society he belong to, whether he be a manufacturer, a farmer, a laborer, a lawyer, or a scientist, will take pains to see that he attains for himself and his operations the highest degree of efficiency and gives the maximum service or product to the Nation at the lowest cost consistent with efficient operation and effective standards of living; but it is inconceivable to me that any patriot should aim to do less or to seek mere selfish advantage. It is obviously the duty of each civilian to reveal by his conduct the same standards of patriotism, devotion and sacrifice, if

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necessary, either of life or property, that we expect from the men whom we send to the front directly to bear the brunt of battle.

I am confident that it is in this spirit that you, all the other agricultural leaders, and the great body of farmers whom we serve, approach the grave tasks confronting the Nation. There can be no turning back. The rights of the Nation must be vindicated and its institutions preserved. Those who would keep the people of the world from going about their business in orderly and decent fashion must be taught a lesson once for all. A finish must be made of all things feudal, humanity must be safeguarded, democracy must be impregnably entrenched, the lesson must be forced home that the worthy and tolerable national aspiration is to have a clean household from cellar to attic, and a durable and righteous peace must be secured.

THE PRESIDENT. The committee on college organization and policy makes its report this year in two sections, one of which, the briefer section, will be read by President A. R. Hill of the University of Missouri.

A. ROSS HILL. The committee on college organization and policy was about ready to present a report on administrative organization this year, and possibly on business organization, but new problems that have arisen on account of the war have led it to devote its main energies for the last three days to problems other than those originally contemplated. The following statement, therefore, simply represents the work previously practically completed and finished at this meeting. I am presenting it here because the chairman of the committee is now the President of the Association.

PARTIAL REPORT OF THE COMMITTEE ON COLLEGE ORGANIZATION AND POLICY

SECTION I

For the past two years your committee has given special attention to the study of administrative organization for educational purposes. A subcommittee has had direct charge of this problem and another sub-committee has been responsible for the study of business organization. This section of the report deals exclusively with the problem of administrative organization to which the entire committee as well as the sub-committee has given much consideration.

In connection with this study the committee, and especially the subcommittee, wishes to acknowledge great indebtedness to Dr. C. D. Jarvis of the United States Bureau of Education. He made in its behalf a study of the administrative organization of each college of agriculture in America, analyzed the data, and suggested the formulation of principles which after discussion and amendment are herewith submitted as the recommendations of the committee.

The following set of recommendations concerning the organization and administration of Land-Grant Colleges should be regarded as suggesting a form rather than an arbitrary standard.

RECOMMENDATIONS

1. That the individual specialist, capable of working independently, should be regarded as the unit of organization.

2. That the group of working specialists on any one of the recognized subjects, regardless of the kind of service, should constitute the subject-matter department.

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3. That specialists should devote their time mainly to one kind of service, but provision should be made for exchanges for the mutual advantage of each.

4. That one member of each department should be designated as chairman or administrative head.

5. That the members of the subject-matter department should be given a voice in the designation of their chairman or administrative head.

6. That authority for subject-matter should be confined to the group of specialists comprising the subject-matter department, and that administrative control should be limited to the amount and method of work.

7. That the distribution of administrative authority should be on the basis of the kind of service.

8. That the three kinds of service, each in charge of a secondary administrative officer, should be coordinated under a chief executive who, in the case of a large institution composed of several faculty groups, should be an officer other than the president.

9. That the official designation "dean" in an agricultural college should be applied only to the chief executive officer who is responsible for the coordination of the three phases of agricultural service, and that of "director" should be applied to the coordinate officer in charge of each of the three lines of service—resident instruction, research and extension.

10. That when one individual performs the duties of two or more offices his official designation should identify clearly the officer with the respective offices assigned.

11. That the leaders in charge of the various phases of the extension service should be regarded as administrative officers and should not usurp the duties of the specialists in the various subjects. Where an individual serves both as specialist and administrative leader a dual responsibility should be recognized.

12. That in the promotion of extension projects controlled by either connected or cooperative colleges the same administrative relations with the subject-matter departments concerned should exist as with departments that are organically connected.

13. That incoming correspondence, except that of an administrative nature, should be referred to the subject-matter departments concerned and there referred to the individual best qualified to supply the desired information.

14. That specialists in whatever kind of service should be on an equal basis from the standpoint of rank and official designation. If differentiation of extension and research specialists is desirable, the prefixes "extension" and "research" respectively may be used in connection with the customary professional titles.

On motion, Section I of the report of the committee on college organization and policy was received. (For Section II, see pages 70-79).

THE PRESIDENT. The report of the committee on experiment station organization and policy will now be presented by its chairman, Dean Eugene Davenport of the University of Illinois.

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Report of the Committee on Experiment Station Organization and Policy

Publishing the work of the experiment stations

The subject of publications, their kind and character, is as old as the experiment stations. It was considered at the first convention of this Association in 1885, has been reported upon by various committees from time to time and in one form or another has been an almost perennial topic. It may, therefore, seem a trite one at this stage, but changed conditions surrounding the stations have given to it a renewed interest.

The section on experiment station work discussed the subject of "station publications" as a feature of its 1915 program and, finding wide differences of opinion and practice, decided to refer the matter to this committee, with the request that it "consider the advisability of recommending to this Association some definite policy touching station publications that may tend to bring about greater uniformity." Apparently the scope and character of the different classes of publications, as well as the kind of series to be maintained, was a phase of the subject concerning which consideration was desired.

This subject was discussed intelligently and with clearness at the second convention of this Association in 1889, especially by one member, who pointed out the need of three classes of publications, namely, regular bulletins, special bulletins and annual reports. The bulletin, it was contended, should give information regarding the station's findings and be brief, popular in form and designed particularly for farmers. "The [regular] bulletins tell results but not how they were got and what the processes were." Hence the need was urged for a special or technical series reporting data of interest to technical students. It was declared that the regular bulletin "is no place for this matter" and "I do not believe the annual report is the place for it." The purpose of these special bulletins, as is the case with our present research bulletins, was to keep these technical matters out of the regular bulletin series and to preserve them for the use of technical students and investigators.

The annual report, it was contended, "should be an official document, not scientific in character. It must contain a statement of progress, a resumé of the work, of the experiments made and suggestions we would like to have considered by the authorities." It was to furnish a connected history of the work of the year, with a list of the bulletins published, and perhaps abstracts of them, statements of important matters concerning the various departments, suggestions, recommendations and a financial statement.

This program for station publications accords remarkably well with our present ideas of the series to be maintained and their general scope. However, in their development the stations became charged with a variety of police and regulatory duties and early assumed the function of giving general instruction and advice to the farmer. As a result, their publications took on a somewhat heterogeneous character, which gave a confused and distorted idea of the true field and function of an experiment station. Up to a few years ago one would get no clear idea from the publications of some institutions as to what the field of the station was conceived to be and how its work was differentiated from that of the other branches of the college. The name of the station on the title page

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of a publication was no guaranty that it related to work done by that particular experiment station or properly in the field of station work. This condition undoubtedly injured the scientific standing of experiment station publications in the past, and, because it frequently masked the new work in a mass of other material, it deprived the stations to a certain extent of the recognition they have deserved as agencies of high-grade investigation.

The development of research under the Adams Act more sharply defined the field and function of the experiment station, and the recent organization of a comprehensive system for agricultural extension throughout the country has tended to restrict the stations more definitely to their specific field of investigation. While this has naturally affected their publications, it has not yet resulted in a differentiation which fully reflects their special field of activity. A considerable number of stations, for example, continue to issue publications which are purely informational and advisory or for promotion purposes, the subject-matter not being new or derived by the issuing station but drawn from various sources of information. Often these are quite elementary treatises, such as might be expected to issue from the extension divisions. Some of them are frankly called "bulletins of information," but often they are so written that their compiled character is not obvious to the casual reader; and where they contain a little station work in the form of new observations and trials, these are so obscured by the preponderance of compiled matter that it is difficult to identify the new work. Again, the regular bulletin series contains in a number of cases official announcements of college programs, accounts of egg laying and other contests, advanced registry of stock, directions for the construction of farm buildings, beautifying home grounds, aids to settlers, stallion enrollment and licensing, plans and statistics relating to cooperation among farmers, methods of organizing farmers, manuals of farm drainage, rural sanitation, country life topics, social centers, etc. Many of the circulars are essentially extension publications bearing the experiment station label. It is often explained that the popular circulars are prepared and used for answering correspondence, which, in view of their character, suggests that the station is burdening itself with a class of inquiries which might properly be turned over to the extension department.

In the judgment of this committee, the stations ought frankly to accept the fact that their present field and functions are agricultural investigation and experiment—the discovering and verifying of exact information pertaining to agricultural science and practice, and this view ought to be clearly reflected in their publications. Their success lies in that direction, for they cannot hope to compete with the extension departments now organized in a large way with steadily increasing funds. These on the other hand must rely upon the stations very largely for the matter they attempt to teach and demonstrate, while the stations can secure through their cooperation the desired contact with the public and can effectively place their practical results and recommendations before the farmers. Manifestly, the stations should not be wholly cut off from contact with the agricultural industry, and it is proper and just that to them should be accorded credit for the matter given out through extension channels, so that the public may not lose sight of the practical character of their work and may know the important part they are playing.

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An examination of the various classes of publications now being issued shows considerable diversity in the number and character of the series which are being maintained at different stations. While absolute uniformity cannot be expected and is probably not worth seeking, an attempt to systematize the method of publication and to make different series more uniform in character may simplify matters for readers and librarians and result in a more orderly series of publications. This need not imply any attempt at standardization. The present diverse condition is shown by the series of publications now being issued under separate designation. These include Bulletins, Technical or Research Bulletins, Special Bulletins, Monthly Bulletins, Inspection Bulletins, Control Series, Seed Laboratory Bulletins, Farmers' Market Bulletins, Poster Bulletins, Popular Bulletins, Bulletins of Information and Press Bulletins, Scientific Contributions, Memoirs, Meteorological Observations, Circulars, Inspection Circulars, Official Inspection Circulars, "Special Circulars," Hints to Poultrymen, "Experiment Station News," Annual Reports, Soil Reports, Soil Survey Reports and "Miscellaneous Publications"; and, in addition, a variety of unnumbered bulletins and circulars which stand by themselves. No single station has all of these groups, but several stations have a larger number of series than seems to be necessary properly to classify their material.

As there is lack of uniformity in the series maintained, so there is diversity in the character of the different series. There seem to be no general standards which are observed in a broad way. At some stations the regular bulletins are confined to semi-popular accounts of experimental work, while at others they include highly technical reports of research, handbooks and manuals and very general information. The bulletin series usually carries reports upon the inspection and control work with which the station is charged, often includes the annual report of the station, and frequently sub-series devoted to reports of state officers, the different branch stations and the like.

The annual report may be issued as a separate document in its own series, or may be found in the regular bulletin or the circular series, or in the report of the College or of the State Board of Agriculture. Or it may be looked for in vain because it has not been issued, as is the case with several stations. Circulars mean one thing at one station or at one time, and another thing at a different place and time. When to this lack of system is added special series, miscellaneous series and unnumbered bulletins and circulars, it is evident that considerable confusion is presented in this class of literature.

Accepting the thesis that the publications of an experiment station properly consist of accounts and records of its experiments and investigations and of their applications, and leaving to other agencies the dissemination of general information and experience, propaganda, descriptions of farm devices, methods in farming, etc., several different classes or series of publications are necessary to meet the needs of the station. This need arises out of the varied character of its constituency and obligations, not entirely confined to farmers, and the varied character of its work, some of which is too technical to be of immediate general interest. The form and substance of a publication need to be adapted to the matter in hand and to the particular audience addressed. This naturally implies a classification based on the nature of the material and the use to be made of it. Such classification is also an aid in proper distribution.

The following series or classes of publications are believed to cover

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the usual needs: (a) regular bulletins, designated merely as "bulletins," (b) research bulletins, (c) technical papers published in scientific journals, (d) regulatory bulletins, (e) circulars, (f) annual reports. In each class there should preferably be only a single series—that of the station as a whole, not sub-series for the different departments or groups of subjects. The subject-matter of bulletins should be the product of the experiment station staff, rarely papers by persons outside the station staff unless specifically employed, or theses of college students studying for advanced degrees.

Regular bulletins.—The regular bulletin is for the general reader; hence it may not be too technical or lengthy or too detailed in its treatment, but so prepared as to convey a clear understanding of the plan, the scope and the results of the work and their application. It should, as a previous report advised, be devoted primarily to the publication of such "results of the station's own work as appear likely to be immediately or directly useful or interesting to the serious student of practical agriculture, especially the farmer." It is inadvisable to make it a treatise on the subject, but it may properly contain such preliminary explanation as is necessary to give the new work the proper setting and make the subject understood. While reference to the work of others is often advisable to make clear what the author has contributed, extended bibliographies, discussions of the literature and controversies are not considered in place in this class of publications. Naturally, the bulletin will need to be adapted to its prospective readers and these rather than his scientific colleagues should be kept in mind by the writer. This will serve to determine the class of data to be included, which will as a rule be such summaries as are necessary to the presentation of the results in their final form rather than in detail. Its purpose, as previously suggested, is to present in concise and readable form the facts and results obtained, but only sparingly to describe the technical processes by which they were derived. Although its manner of presentation is semi-popular and some explanatory matter may be included, it is desirable so to set forth the work and results as to show just what the station itself has done and to make it clear that the bulletin is not a popular write-up with some incidental new work carried as a rider.

If, as suggested, the bulletin is to form a semi-popular record of progress of the station's own investigations, this would eliminate academic discussion and statistics of such subjects as farm credit, rural organization, cooperation, tenancy, etc., assigning these as far as they are in the province of the station to another class. The same applies to reports pertaining to the regulatory functions with which the station happens to be charged.

Odd sized bulletins are to be avoided, as these increase the difficulty of preserving complete files and especially in binding. A previous report has urged adherence to the regular octavo size. Spray calendars and poster bulletins are also preferably eliminated from the regular bulletin series, since they are of less permanent value and are of a size which makes trouble in binding them with the regular series.

The detailed records of investigation and the results of purely technical inquiries are usually not suited to general distribution. They are primarily of interest to workers in science, specialists and students of agricultural investigation. This class of matter is best provided for in technical journals and in bulletins which are given special distribution.

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Research bulletins.—Technical bulletins, usually designated as research bulletins, are now issued by about a third of the stations in a separate series. They are designed to record in considerable detail the data and results of inquiries which, at that stage at least, are primarily of scientific interest, putting on record the methods and process by which they were secured; and they are addressed primarily to scientific workers, teachers and other students of agriculture. Hence they are published and distributed in relatively limited editions.

In other cases these technical accounts of investigations are published in the regular bulletin series, sometimes being designated as research bulletins and sometimes not. In any case it is deemed desirable to give such bulletins special distribution designed to place them in the hands of those primarily interested.

In cases where the investigation reported in this class of bulletins has a practical bearing which gives it a broader general interest, it is desirable to issue a condensed less technical edition which may be sent to the regular mailing list.

Journal articles.—These are of practically the same general character as the matter published in research bulletins, although in some instances they are briefer and relate to smaller pieces of work. Such papers are sometimes issued to give preliminary notice of investigations and their progress. The majority of scientific journals of the country are now open to the experiment stations, and the *Journal of Agricultural Research*, published by the United States Department of Agriculture in cooperation with this Association, has afforded further means for the prompt publication of such contributions.

It is important that all such papers published through outside channels retain their character as publications of the experiment station from which they emanate. They should be designated as contributions from the station in question and should be listed in the records of the station's publication. It is clearly desirable that the manuscript pass through the same channels as any other publication and receive formal authorization before being submitted outside. The practice of securing a limited number of reprints for filing and for exchange is commendable.

Regulatory bulletins.—The extent and variety of regulatory functions have reached considerable proportions at many of the stations. These functions include not only the inspection of fertilizers, feeding stuffs, nursery stock, fungicides, insecticides, and similar materials used in agriculture, but supervision of food and drug inspection, foul brood inspection, stallion registration, special measures for the control or eradication of pests and similar lines. It is recommended that all the station's publications relating to these functions, without regard to the particular kind, be brought together in a separate series under appropriate designation and numbered consecutively for the convenience of librarians and for reference. Some half dozen of the stations have already adopted this plan, designating the series as "official inspections," "inspection bulletins," "control series" and "special bulletins." The extension of this practice is recommended, since it distinguishes between the work of an experiment station in investigation and its activities in carrying out regulations prescribed by local laws and the classification facilitates distribution to those especially interested. Ordinarily they need not be sent out as widely and generally as the bulletins of the regular series.

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Circulars.—The popular information circulars of the past have been largely superseded by the extension series. There may still be a place for a circular series at some of the stations, however, for popular accounts of small pieces of work, warnings, preliminary announcements, information as to general conditions gathered from observation or study of a situation and academic discussions of the status of movements for agriculture, such as cooperation, marketing, rural credit, etc. If these matters are raised to the grade of investigation or actual experiment, their proper place is in the bulletin series.

Circulars are often employed for publishing matter which is not of as permanent a nature as that in the bulletins or does not require permanent record, but it is deemed unwise to make this series the sole repository of matter of scientific or permanent value. Articles dealing with the construction of farm buildings as a result of the station's experience, spray calendars, egg laying contests, advanced registry reports, information on the agricultural possibilities in certain lines or localities and similar matters as far as they lie within the field of the station, seem best suited to the circular series, as do those designed to answer inquiries for general information along the lines of the station's findings. Popular editions of bulletins, where such are issued, may also find place here. But the issuing of popular compiled information for publication in the circular series is not within the present scope of experiment station work and is advised against.

Annual reports.—The annual report is an administrative document. As such it properly emanates from the director's office. It is designed to be an epitome of the station's progress during the year. It serves as a permanent record of the lines of activity of the station, changes in its personnel and equipment, the use made of its financial resources, etc., with suggestions as to its plans and needs. It should list the active projects and the publications of various classes which have been issued during the year, including the papers published in outside journals. It is not believed to be the best place for the publication in detail of new station work, especially technical studies, and it is advised that it should not be made the sole repository of new research.

The plan sometimes followed of reprinting in the annual report the bulletins and other publications issued during the year is not thought necessary, since it results in duplication and in confusion in binding without serving any essential purpose beyond securing a certain amount of state printing.

The annual report should preferably be issued under its own caption and in its own series. Where for bibliographical reasons it is preferred to place it in the bulletin series care should be taken to designate it clearly on the title page as the annual report, stating the year covered.

Manifestly the annual report should deal exclusively with the affairs of the experiment station. It is unfortunate to include in it a discussion of educational work of the college or the extension activities, even though the director of the station is likewise dean or chances to be the head of the extension division.

Press bulletins or notices, where it is found desirable to issue such through the experiment station, like other publications should deal with the work and findings of the issuing station.

Any scheme for publishing the work of an experiment station will require some supervision at the outset if it is to be consistently adhered to.

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Manuscripts will frequently need attention to assign them to the proper channels or adapt them to the class of publications for which they are best designed. The importance of carrying out consistently a plan of publications adopted by a station and the difficulties of this in the past suggest the desirability of providing in connection with the director's office some machinery for assuring systematic attention to manuscripts and matter in course of publication.

Respectfully submitted,

E. Davenport, *Chairman*,
C. D. Woods,
F. B. Linfield,
C. E. Thorne,
B. W. Kilgore,
E. W. Allen,
Committee.

On motion, the report of the committee on experiment station organization and policy was received.

On motion, a recess was taken until 8 P. M.

Evening Session, Wednesday, November 14, 1917

The Convention was called to order at 8 P. M. by the vice-president, President C. A. Lory of the State Agricultural College of Colorado.

The Vice-President. Our President needs no introduction to this gathering. For many years he has been a faithful worker amongst us. I am sure that he has a message for us. It gives me great pleasure to present President K. L. Butterfield of Massachusetts, who will deliver the annual presidential address.

Presidential Address

By K. L. Butterfield

The Morrill Act Institutions and the New Epoch

The grim, sad, tragic, but imperative business of the day for each American citizen is to help win the war. No energy should be spared, no service omitted, no talent neglected, no sacrifice refused, that may help win the war.

This high personal duty of the passing hour presses with equal force upon institutions such as those represented in this assemblage. Our current policies should be determined solely by the answer which our best judgment gives to the question "Will it help win the war?" We too must sacrifice—men, money, methods. Our machinery should not be crippled uselessly—indeed it must, if possible, be made more efficient than ever before. But our present effectiveness must be sought in terms of a supreme effort to help win the war.

For the mind of America now understands the keen danger to herself as well as to other nations from brutal, conscienceless, organized might striding up and down the earth. The heart of America now feels that both self-interest and chivalric duty call upon her to help rescue the world from scientific ruthlessness and paganized efficiency. The will of America

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has set itself irrevocably to do battle alongside the Allies until the day when the dark menace of world domination by irresponsible war-lords is forever dissipated and when reason and goodwill have fair guarantees of another chance.

We would not dissemble a proper pride that the Land-Grant Colleges and Universities have nobly and effectively met the challenge. Their resources have been placed at the disposal of the Government; their faculties have rallied to emergency service; their sons have flocked eagerly to the front. They are straining every nerve in order to help win the war. There will be on their part no relaxing of will nor abatement of energy until the goal is reached.

As we come together under these unusual circumstances our inclinations doubtless lead us to discuss the issues that are so patently uppermost. There are perhaps those among us who hold that the clarion call for the continuance of our utmost exertions can leave us no time for considerations other than those connected with the immediate prosecution of the war. But this is a hasty conclusion. We must win the war, not for victory's sake but for the world's sake. The meaning of the war is bigger than the war. We cannot justify our entrance into the war except in terms of some fundamental war aims. In one sense it is correct to say that there are deeper depths in the swirling current of world affairs than even the momentous task of winning the war. For the war has ushered in literally a new epoch in history, fraught with the most stupendous possibilities of human development. And this thing is upon us now. The present situation is a part of the new order. We cannot escape its significance. We must think about it and talk about it.

Consequently, thoughtful men, particularly men connected with educational institutions, have a duty fully as sacred as that of helping to win the war, to assist in adequate preparation for the era after the war. Indeed it would be the wisest statesmanship at once to set apart groups of men and women whose sole task would be to consider with the greatest care the probable needs of the new epoch, and to develop such plans of action as may ensure the largest possible good out of all the sacrifice and chaos of the conflict.

So I make no apology for my subject: "The Morrill Act Institutions and the New Epoch."

Some Characteristics of the New Epoch

I believe our President would be the first to admit that his immortal phrase, fully as it describes the great war task of the Allies, does not fully express the world's real business when the battle flags are furled. Yes, we are pledged to help win the war because "the world must be made safe for democracy." But once the war is won, the world must needs devote all its energy to the supreme concern of "making democracy safe for the world." The fundamental characteristic of the new epoch will be the urgent, persistent, world-wide quest of a democracy that is at once genuine in its quality, inclusive in its scope and fully efficient in its social capacity. It behooves us then to discover, if we can, the abiding principles of democracy which the war has vitalised and will project into the new era. I think there are four of these:

1. There will be a new conception of democracy.

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2. There will be a supreme effort to reconcile real democracy with organized efficiency.

3. Racial and national antagonisms will begin to disappear in a new merging of common human interests.

4. The religious motive will more fully dominate in the affairs of men.

I. The World Will Achieve a New Conception of Democracy

Are we sure that even in our own land, after generations of democratic striving, we hold no fallacies with respect to the full meaning of democracy? Do we fully realize that the worst foes of democracy are those of her own household?

WHAT DEMOCRACY IS NOT

May we list some of the most serious misconceptions of democracy, especially in America?

1. Are we not, first of all, too content with the forms of democracy without its reality? For more than a century our largest city has been governed much of the time by one of the most autocratic, irresponsible and predatory oligarchies of all modern history; and within a few days the beast has returned to the wallowing! We must have the kernel not the husks of democracy.

2. One of the most mischievous notions among us is the assumption that political democracy assures complete democracy. We find this idea in the expressions of our statesmen, as well as in public opinion. As a matter of fact, in what we thought to be the most democratic country in the world, actual control of our material resources—aside from farm land—is in the hands not of the many but of the few. The control of the distribution of the products of the soil is not in the power of the producer. And while the farm land is still democratized, this freedom too is menaced by a rapidly growing tenant system. Whatever may be said in defense of this situation, the fact that it is not democracy begins to stare us baldly in the face. True democracy must permeate all aspects of the work and life of the people.

3. Democracy may take the form of encouraging a rampant individualism, based on keen self-interest, that apparent equality which gives the weak no real chance in the race with the strong. This is the great sin against democracy. Tagore's suggestive comment on American life is that it permits the development of organized self-interest. The common welfare must be the main concern of the democratic commonwealth.

4. It may be that we shall have many sad experiences in America before we learn the difference between democracy and mobocracy. Mobocracy rules whenever laws are defied, prejudices exalted, ignorance placed in the saddle, by groups or classes, large or small, rich or poor.

5. One of the most curious aspects of the democratic idea is the fact that the majority of us are born aristocrats! The desire to excel others—and the very human foible of wanting to display the excellence by style of dress, or ribbon, or title—is perhaps the most powerful motive in human life. Who would be a private that could be a captain? What open or secret admiration of the rich or successful by the poor or unsuccessful! What worship of the great god Gain! No matter if he have feet of clay, he hath a gilded crown that sparkles in the sun!

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6. Perhaps the most serious single defect of democracy is its unwillingness thus far to recognize the trained man, the expert, the superior man if you will, as an agent of democracy. There is a deep-seated belief that one man is "as good as another" in all public service. We shall come to this thought again in our discussion.

I am inclined to agree with those who assert that the defects of democracy are one of the causes of the war. I am willing to concede to the German people a sincere belief on their part that their "Kultur"—their effective method of living—would be really good for the world. Their missionary methods we hardly approve! They have yet to learn that the Kingdom cannot be taken by force. Even Teutonic science has not yet synthesized a tree!

America is already conscious of many of these defects and has set about the task of trying to remedy them. The war will accentuate both the defects and the power of reconstruction. For nearly a century and a half America has held aloft the torch of democracy. It has been a beacon to many weary, storm-tossed nations. The flame may not always have burned at full brightness, but thank God it has never gone out. And now? And now that our eyes are opened to the world-need, and our hands are stretched across the seas to help, the oil of sacrifice will kindle the fire anew and for all time.

SOME ELEMENTS IN TRUE DEMOCRACY

But what is the broader conception of democracy that we assert is to be one of the hallmarks of the new epoch?

1. First of all, democracy means real equality of opportunity. The word "equality" has often borne the burden of false notions, even of demagoguery. It has been made to cover ambitions for equality of talent, of achievement, of happiness, of wealth, of social capacity. But democracy was never meant to disregard the stern realities of the inevitable limitations that define persons. The opportunity that democracy seeks is the removal of all removable barriers, from whatever sources they arise, that tend to crib, cabin, or confine the individual in his quest for the full growth of such faculties as he possesses.

2. Democracy also implies authoritative participation of the people involved, in all the activities that determine their welfare. Government only by consent of the governed is a principle valid not alone in civic affairs, but in the business of producing and distributing material wealth—indeed in all the relations of men. All business in the deepest sense is public business. No superman however wise, no group however intelligent or high-minded, no class however large or worthy, can dominate a true democracy except by common consent. Democracy is achieved only when the terms under which men and women work and live are governed by the people concerned in the interests of the whole of society.

3. Democracy exalts manhood as a thing sacred in itself. It therefore becomes an attitude, a spirit, a point of view. Whenever the dollar is placed above the man, whenever working men become so many "hands," mere cogs in a machine, whenever the price of efficiency is the stunting of the human soul—democracy has failed of full fruition. The culture of the common man is the crown of democracy.

4. Again, democracy means responsibility. Unfortunately the mass of mankind in its age-long struggle for popular freedom has been obliged

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to stress its rights to such a degree that its conscience is often dulled. How frequently is the full duty of the citizen neglected; how characteristically labor in the warfare for its rights disregards its duties of utmost service. Personal talent is as much a possession of society as is land or waterpower. True democracy has far more concern with the desire of men to serve the common good than with the insistence of individuals, groups or classes, upon particular rights. Labor or farmers' organizations are fully justified in seeking the rights that unfortunately they are likely to get only in this way; but the greater justification of such association lies in the added power it gives the group to serve the common weal. Democracy spells duty.

5. And finally, a full measure of democracy is impossible without a certain fraternal attitude. The competitive spirit is deeply rooted in human nature. Group or class struggles are inevitable in a world of imperfect men. Misunderstandings, personal, racial, class, will arise. Rivalries will ensue. But if running through all the activities of society, we find a growing spirit of goodwill, a real attitude of friendliness, we know that democracy is making headway. The sense of brotherhood is the heart of democracy.

II. There Will Be a Supreme Effort to Reconcile Organized Efficiency with Real Democracy

The modern world is permanently committed to efficiency as an ideal. But what is efficiency? Is it compatible with democracy? And what are the methods of efficiency? Are they consistent with proper personal freedom?

The immediate objective of modern industrial efficiency is simply the greatest possible thrift of time, materials and money, in the processes of of extraction or fabrication or distribution of goods. The motive is profit; the basis, knowledge; the method, organization. Individuality in industry is practically a thing of the past. Men are now assembled into highly organized groups and managed by some authoritative, semi-military, even autocratic method. Organization is the one essential efficiency.

Has democracy any quarrel with this conception of efficiency or its method? If dignity of personality is a prime element in a democracy, the first question we will ask of efficiency is, What is the effect of your plan upon the worker himself? Not merely is his economic reward fair or adequate, but what happens to him as a man? All of us—society—want shoes produced as efficiently as possible; but if the price of the process is a stunted man, we pause. Cheap shoes are desirable; cheap men are deplorable. We soon find that efficiency is not so simple as it seemed at first to be. Neither elimination of wastes, nor all the forms of thrift necessary, nor the profit of the investor, nor the wage of the worker, tell the whole story. What kind of men does this process produce? Society wants efficiency in production of goods; but the life-blood of society is sound men.

But can we reconcile the idea of compact organization with the fundamental elements of democracy? It may help us somewhat if we consider for a moment what organization is. Organization at bottom is nothing more or less than the correlation of all the factors entering into whatever process is necessary to get the most satisfactory results. The issue arises, not in organization itself, but in its form and spirit. Organization may

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be autocratic; that is, it may be handled by one man or a group of men who, by sheer authority which they assume because they have the power to assume it, govern the whole machine. In such a case the participants have no voice. However, organization equally autocratic in method but entirely different in spirit may be attained by the individual participants mutually agreeing to serve under the management prescribed.

I suppose that recent legislation, for example, to use a political illustration, has placed in the hands of the President of the United States as complete autocratic power as has been in the hands of any man for centuries. And yet, intelligently, fearlessly, the American people subscribed to this sort of autocratic organization. Why? Because they have perfect confidence that they can and do hold the situation entirely in their hands. There is a vast difference between a responsible and an irresponsible autocrat. Now, in the case of the responsible autocrat the form of organization is really cooperative, not autocratic; the method may be fully as much one of authority and even of imperious authority as is the case under the compulsory form of organization. But the authority is delegated and possibly temporary.

The management of an army is probably the most autocratic affair in existence. Yet a democracy may have an efficient army. Personal freedom is voluntarily surrendered, even life itself placed in pawn, to some large good. President Gulliver of Rockford College puts the whole matter in a sentence:

"Intelligent and voluntary cooperation versus coercion—physical, political or religious—is the characteristic note of the efficiency of a democracy as over against that of an autocracy."

Here then is our problem: How to attain organized efficiency, and still retain the individuality, honor the personality, obtain justice for and secure the full welfare of all concerned. This is the great problem of the new epoch. This problem is given a fine personal setting in a quotation from the "Survey," in speaking a year ago of the untimely death of Robert G. Valentine, an ardent prophet of humanized efficiency:

"He was devoting his life to reconciling the scientific spirit with the spirit of democracy. He believed that the reconciliation of these was the great problem of today and the task which he had undertaken."

A capital example of highly developed industrial organization in a democrary is the Panama Canal, the greatest engineering enterprise ever built by a government, either autocracy or democracy. Without going into detail, it may be said that there seem to be four main characteristics of this enterprise which illustrate the fundamental principles by which real democracy and thoroughly organized efficiency may be reconciled.

1. Experts were placed in charge. Men were employed who knew—engineers, administrators, physicians. They were men of training, of experience, of proved ability in specialized lines.

2. Ample authority was given the men at the top, authority so complete that it was practically autocratic—and I suppose there is no doubt it was exercised in a thoroughly autocratic manner. There was no interference from below or from above.

3. Full justice was done to the individual workman. He was given fair pay; his health was guarded; he was offered opportunity for recreation; he was treated as a man.

4. There developed a wonderful esprit de corps. This grew partly

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out of the fact that individuality was given full recognition so long as the man did his work well. But the great reason for this fine spirit was that from top to bottom of the list of employees, men felt they were there to do their work as a contribution to a great patriotic service.

III. Racial and National Antagonisms Will Begin to Disappear in a New Merging of Common Human Interests

There seem to be two main roots of trouble in international affairs—racial antagonisms and imperialism. One of the great discouragements of the present situation in America consists in our final reluctant admission of the fact that we are a bundle of races rather than a nation. "Our polyglot boarding-house," as Mr. Roosevelt calls it, must be turned into a family hearthstone.

Whatever the causes of racial antagonisms, such attitudes are clearly undemocratic. For the essence of democracy is recognition of personality. A human soul is a human soul. Race, color, culture must, in a democratic world, merge into common human interest and sympathy. A way must be found to make the melting pot melt. As the war has accentuated racial differences the world over, so its aftermath is sure to be a tendency to solidify such elements of fraternal feeling as the struggle has aroused afresh, into a larger and more generous world spirit. The leaven of alliance in the present struggle will soon begin to leaven the whole lump of world concerns.

Imperialism has thus far been a mixture of political and economic motive. Pride of power, love of dominion, both personal and national, have played their part on the stage of conquest. But I suppose that fundamentally such economic considerations as pressure of population upon land, search for stored treasure, ambition to control markets, and other similar items in the category of business are chiefly responsible for international difficulties. Economic imperialism is the sole possession of no one nation or group of nations. It everywhere plays the same role in national relations that the desire to excel plays in personal relations. It is instinctive, unescapable.

Assuming that the central powers can not win, we may expect that the war will aid in restricting the sway of political imperialism. The very fight to make the world safe for democracy guarantees that outcome; although it is not to be supposed that democracies may not be politically ambitious. On the other hand, economic pressure will probably be even more insistent than ever before. Huge debts, enormous interest charges, meager capital for reconstruction will spur commercial competition to its utmost. Let us not blind our eyes to this prospect. Preparations are already under way to push huge commercial campaigns the moment the normal tides of trade begin to flow. Let us remember that the fires of warfare are often lighted by the mere friction of economic conflict. How can we democratize the struggle? The cure lies chiefly in sound economic education for whole nations, buttressed by the moral, yes the Christian, appeal.

1. First of all, let us seek to be rid of what is perhaps the supreme economic fallacy of the time, that you can sell without buying. Artificial barriers to exchange must be lowered if not leveled. Fair trade is democratic.

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2. We must learn that it is not true that the self-sufficing nation is the most efficient contributor to the world's well-being. Of course, if we are to continue to think in terms of imperialism, of military strategy, let us urge ourselves into complete national self-sufficiency. Let us grow everything we need. Let us encourage national profiteering. But if we really seek world peace, we must pursue it along the channels of the great economic principle of international division of labor—encouraging each nation to produce what it is best fitted to produce of the world's wants.

3. It is doubtful if commercial competition can ever be made fraternal and peace-supporting under the purely economic motive of mere gain. We may not expect world harmony unless the desire to serve greatly takes possession of nations as it is slowly but surely gaining headway in the hearts of individuals.

The fundamental issue is that of a sane nationalism correlating with a fraternal internationalism. We need a world-citizenship; though not the sort of free-love in patriotism that unfortunately sometimes bears the name of "internationalism." A friend of mine, a professor of sociology, writes me:

"I believe heartily in a higher nationalism which shall be part of the same world-system with a stable internationalism. The predaceous and jingoistic nationality is a kind of atavism, and I hope that after the war it will gradually subside. The war is as much a struggle between higher and lower ideals in all nations as it is between two groups of nations."

"World power or downfall" as a national slogan must give way to some such universal sentiment as "World brotherhood or barbarism."

IV. The Religious Motive Will More Fully Dominate in the Affairs of Men

Civilization stood aghast when the leaping flames of the world war lighted the skies. Its first cry was one of despair—"Christianity has failed." The antiphonal was, "Christianity has never yet been fully tried." We have been told that the world will require a century to recover its faith. I am persuaded that the most significant and perhaps the most permanent result of the war will be a great revival of religious faith.

In the new epoch the consciousness of God's powerful but benign purpose; of His friendly and even fatherly attitude; of the slow but irresistible fulfillment of His masterful plan for a world of men seeking perfection; a consciousness too of His wonderful method, by which man's chief task in the world is that of coadjutor with God in the working out of the plan—these really essential aspects of religion will have a new birth of power. They were conceived in the dawn of our own religion in Ur of the Chaldees; they were nurtured on the hills of Palestine; they were given supreme expression as well as full incarnation on the shores of Galilee; they have been for decades of centuries the life-blood of great humanitarian movements and of unselfish toil. But too often have they been buried beneath heaps of formalism, of scholasticism, of institutionalism. They are now to spring afresh in the soul of man to guide, to inspire and to direct all human activities.

For let it be said at once that the religious concept of the Kingdom of God on earth is equivalent to the full realization of a complete democracy. The founder of the Christian religion has been called "the most thoroughgoing democrat that has appeared in human history."

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Seldom heretofore have the strivings for democracy had the full backing of the religious motive. Indeed sometimes the democratic movement has seemed to be quite unreligious, if not absolutely irreligious. But it can be so no longer. Man has at last, by the thunders of the Sinai of a world war, been brought face to face with his God. And a new revelation, a new commandment is being engraved for all time upon the tablet of man's heart.

It would almost seem as if the argument here attempted could be backed by a million illustrations. The heavens are filled with the chariots of the Lord. Two or three quotations must suffice.

That wonderful little book "A Student in Arms," which so successfully attempts to interpret the mind and heart of the British soldier in the war, is permeated with religious atmosphere. May I give a quotation, the length of which is excusable because it seems to me to be one of the finest expressions in literature of that personal aspect of religion which brings the human soul at last to rest in the infinite. It consists of the last paragraph of the chapter "An Englishman Prays." The wounded man "found himself vaguely wondering about the meaning of everything. The stars seemed to make it all seem so small and petty. All this bloodshed—what was the good of it? It was all so ephemeral, so trivial, so meaningless in the presence of eternity and infinity. It was just a strife of pygmies. He suddenly felt terribly small and lonely and he was so very, very weak. He was cut off from his fellow men as surely as if he had been on a desert island, and he felt somehow as if he had got out of his element, and was launched, a tiny pygmy soul, on the sea of immensity, where he could find no bearings. Eternity and infinity were so pitiless and uncomprehending. The stars gazed at him imperturbably. There was no sympathy there but only cold, unseeing tolerance. Yet after all, he had the advantage of them. For all his pygmy ineffectiveness he was of finer stuff than they. At least he could feel—suffer. He had only to try to move to verify that. At least he was aware of his own existence and could even gauge his own insignificance. There was that in him which was not in them, unless—unless it was in everything. 'God,' he whispered softly. 'God everywhere.' Then into his tired brain came a new phrase—'Underneath are the everlasting arms.' He sighed contentedly, as a tired child and the phrase went on repeating itself in his brain in a kind of chant—'Underneath are the everlasting arms.'

"The moon went down behind the horizon and it was dark. They fetched him in at last. He will never again be sound of limb; but there is in his memory and in his heart that which may make him a staunch fighter in other fields. He has learnt a new way of prayer and the courage that is born of faith well-founded."

Perhaps the most influential contributor to this literature of current religious evolution is a layman who is supposed to have been before the war an agnostic if not an atheist—H. G. Wells. In "Mr. Britling," as you know, all the suffering eventuates in a clear recognition that "It was the Master, the Captain of Mankind, it was God, there present with him, and he knew that it was God." The rest of us, too, will "see it through"—to God.

In "God, the Invisible King," Mr. Wells has supplied, it is true, a fantastic theology which has blinded most of his critics to the essential integrity and wonderful significance of that part of the book which voices

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the deepest faith, a newly found but ardent faith—in the religious motive as applied to the activities of human society. Let me read you one of the profoundest utterances of the war:

"Belief in God as the Invisible King brings with it almost necessarily a conception of this coming kingdom of God on earth. Each believer as he grasps this natural and immediate consequence of the faith that has come into his life will form at the same time a Utopian conception of this world changed in the direction of God's purpose. * * * * * * * * Many men and women are already working today at tasks that belong essentially to God's kingdom. This work that they were doing for ambition, or the love of men or the love of knowledge or what seemed the inherent impulse to the work itself, or for money or honor or country or king, they will realize they are doing for God and by the power of God. Self-transformation into a citizen of God's kingdom and a new realization of all earthly politics as no more than the struggle to define and achieve the kingdom of God in the earth, follow on, without any need for a fresh spiritual impulse, from the moment when God and the believer meet and clasp one another."

In its practical religious effect upon the masses of men, perhaps the international war work of the Young Men's Christian Association promises to reach farther than any other organized movement in vitalizing the religious motive in the new epoch. It is probable that by next spring millions of young men will have been reached by a practical, working, virile, effective religious spirit; a spirit that exalts Jesus as Master of man's soul in terms of the friendly attitude, the helping hand, the personal touch. Men will see real religion in action. A new sense of brotherhood, an exhilarating feeling of comradeship under the Great Leader, must make its way in the ranks, no matter what the profession, the nationality, or the creed. These men are coming home from the trenches with new measurements of religious values.

After the war we will see, I verily believe, democracy marching behind the Great Teacher, cherishing as its shibboleth the highest moral ideal and the profoundest spiritual teaching of the race.

A BRIEF SUMMARY

"There are moments when the lover of mankind, in these days, seems to catch a glimpse of a wonderful dawn light. If this dawn soon gives place to the coming day, an era of inspiring promise for the best hopes of all human ages will begin. If the clouds persistently gather again, as at some moments they do, if the night returns, as, for all that the present writer can know, it may return—then the world must wait again for centuries, and must wait in sorrow, for that which the wise and the faithful of many generations have longingly expected."

In these beautiful words Josiah Royce began his inspiring essay, "The Hope of the Great Community." The issue is yet uncertain.

All that has been said in this attempt to describe the main features of the new epoch seems formal and halting as we stand in the deep shadow of the solemn dedication which America has made to the cause of the Allies. These gains cannot even be approximated if we fail to win the war. If we lose, I see nothing ahead but world-wide chaos, monumental debt, undying hatreds, haunting fear, feverish preparation for the renewal of the conflict. For the issue of democracy must be settled sometime—now or a century from now. But there can be no peace without it.

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When we consider the sweep and the range of the issues that are joined in this most devastating war, it is difficult to listen with restraint to some of the comments about our participation in the struggle. Some say we have no concern with the forms of government in other countries. Others avow our lack of motive—all this is meddling in Europe's business. Still others, justifying our action, put it on the grounds of our "having a grievance." Some talk of peace when there is no peace. They all miss the mark by a thousand leagues. They are either blind to the real situation or they are hopelessly medieval in their social thinking. One of the strangest paradoxes of the war is that many of the men and groups who are the progressive if not the radical protagonists of social justice cannot see that the flood gates of a real democracy, which is the only adequate safeguard of social justice, have at last been pried open never again to be closed. These people are indeed short-sighted. They seem oblivious to the pointing of the finger of God. They are stabbing the very angel of light. They cannot see that the world's Gethsemane is just now the only way to the triumph of righteousness. It requires no prophet to discern the inevitable drift of the world tides of human welfare. We are being born into a new epoch. The struggle for the dominance of the democratic principle, not alone in government but in industry and in all social well being, which had been gathering force during recent years—almost creeping its way into public consciousness and into actual realities, is now, by reason of the war, taking giant strides not only in America but the wide world round.

What Can Our Morrill Act Colleges and Universities Do?

This very inadequate discussion of our great theme has nevertheless absorbed far too much of the time you so generously allot to your president. The present answer to the question just propounded must be therefore relatively brief—too brief for real justice to our mission in the new epoch. But if what has been said has, in your opinion, any validity whatever, I am persuaded that its application to our duty and opportunity will carry over without need of aid from me.

But what is the special task of the institutions which we represent? For nearly half a century this wonderful nationalized system of colleges and universities—the greatest "plant" for higher education that government has ever developed—has been doing its work. No man can tell the results that have accrued. They are written in the books of the lives of tens of thousands of students and graduates, and of thousands of thousands of men, women and children who have never even seen the colleges but whose fortunes have been fostered by the research, the teaching, the inspiration, yes, and the comradeship of the faculties of these institutions. Magnificent as is the service already rendered by these colleges, it is but a prophecy of possibilities for the new epoch. In the eager quest for a fuller democracy in which America should lead the way, the Nation must lean upon these children of its own loins, confident that it will find therein the insight, the wisdom, the enthusiasm and the constructive statesmanship that shall enable it to choose its way by clear sight of the path as well as by high faith in its own destiny.

In order, however, that the Morrill Act institutions may play their great part in the drama, certain attitudes and objectives are indispensable.

1. First of all, the colleges must comprehend. They must appreciate

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the length, the breadth, the height, the depth of the democratic movement. They must understand the characteristics of the democratic method. Within the walls of these institutions we should find more completely than anywhere else a full grasp of the fundamental questions which the war is bringing to the fore. We who make policies for these colleges should define functions and shape plans in terms of the main characteristics of the new epoch. We must have intimate sympathy with the masses of men, especially the great farming and industrial classes. To what extent do you suppose Mr. Morrill really foresaw the social aspects of the work of the institutions that he founded? It is a rather remarkable circumstance that, whereas all of us have heard the gist of the significant phrases of the Morrill Act repeated a thousand times, it is very rare indeed to find the emphasis placed upon that most significant phrase of all, "the education of the industrial classes." We usually debate subject-matter, talk about the exclusion of the classics, the definition of mechanic arts and all that sort of thing, but we have usually omitted to consider the most important thing of all, namely, the objective. I have often speculated as to what Mr. Morrill meant by "the education of the industrial classes." I like to think that in Mr. Morrill's purpose, and certainly in the law itself, we find not only a justification of the principle for which I am contending, but an imperative obligation to make it the main concern of the Morrill Act institutions. We are to seek the highest welfare of the great industrial classes in terms of their own prosperity and development, as well as a part of the common, national prosperity and welfare.

We must not merely sympathize with the aims of democracy, we must deliberately choose to serve the complete democracy. We are not to set class against class; rather shall we seek to ameliorate any possible class struggle through an education that broadens the comprehension of all classes. Bishop Francis McConnell has well said:

"The colleges and universities of the land are not to be used as agents of propaganda; but on the other hand, they are not to be turned away from vast human movements because these movements lend themselves easily to the propagandists."

2. The Morrill Act institutions must deal with all the problems of a democracy. In research, they must seek the principles that underly the most effective use of all the resources and powers of earth and sky. But the people demand more than that. They crave also light and leading with respect to those political, economic and social adjustments which they feel are essential to their full welfare. Gentlemen, our programs are still too small and narrow. We can serve the democracy only as we study all the problems of democracy. In our investigations we still stress too much the goal of increased productivity as our great task. We still have too much faith in knowledge of the physical and biological facts and principles as all sufficing. There should be searchings of heart as to our policies and programs. Are they adequate to the needs of the new epoch?

3. Unquestionably the greatest contribution which the colleges make to society consists in the men and women who are streaming out into life as successive "commencements" come and go. We need not stop to discuss whether the success of college graduates is due primarily to the native superiority of material which comes to the college or to the superior training which the college career gives. We need not even concern ourselves here with the faults and foibles of our product, nor invoke "Who's Who"

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to see if we are justified in continuing our job. The great, superb fact for us is that the major contribution of the college to the democracy is the expert on whom reliance must be placed for the leadership which is imperative in an efficient democracy. We are sending trained men and women into all the professions, into industry, into agriculture, into the home, into politics, into education, into social service. In places humble and places great, they are shaping the destinies of our Nation. We have followed a great ideal here and won great results. The aim which President Van Hise sets before the university, and of which his own institution is so conspicuous as leader, is the ambition to "become the instrument of the State in its upbuilding—material, intellectual, spiritual." Yes, we are to be the effective tools of the great community for all its constructive effort.

And yet, my friends, I am persuaded that we have not after all fulfilled our complete duty. The fact that students come from humble homes and later win financial success; that the college discipline makes for self-development in the individual; not even the fact that our graduates are called to the most difficult kinds of technical service—not these things alone guarantee that we are making our full contribution to democracy.

The trained expert serves democracy only as he does the work of democracy, advances its interest, works its will. The expert must be a real democrat. His obligation is to the great society, not to any small or exclusive group of society; or if he work with such a group, always as the ambassador of the mass, the protagonist of the common weal. Oh, not yet have we begun to see our opportunities and our duties to the great common people. We are still too individualistic in our thinking, in our teaching. We still send out too many farmers whose chief concern is more corn; too many engineers who have no touch with the human problems of industry; too many lawyers and business men unmoved by the ideal that their life-aim should be service to the democracy. Some day we may conscript the talents of men for peace, as we now take their bodies for war.

Here at last then is the key to the relation of the Morrill Act institutions and the new democratic era. To socialize as well as train experts; to give men and women a vision of the new social order; to equip them with the tools that may forge for the common man a new freedom out of the shackles of ignorance as well as out of the chains of injustice; to send them forth as persons who know the meaning of life and its toil as well as they know the technique of their chosen calling—these are the very secrets of power for our Land-Grant Colleges and Universities in the new day.

I think the work which is being done by our colleges of agriculture more nearly fulfills the democratic ideal than does any other part of American educational machinery. In scope of research, in range of subjects taught, and particularly in their approach to the working farmer and his family, do these institutions fulfill the law of service to the common good. It is doubtful whether during the past few months America has witnessed any more effective effort on behalf of the emergency than has been performed quietly by the Agricultural Colleges and their coadjutors, the United States Department of Agriculture and the county farm bureaus. We still have a long road to travel before the full measure of our capacity to serve a rural democracy is reached, but our eyes are "front" to the goal of our endeavor.

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What is being done and planned in agriculture needs doing in a field that is supposed to be far more difficult to cultivate—the so-called working classes. But the need and the duty are imperative. And have you noted that last summer the Colorado Federation of Labor voted scholarships for men at the State University?

It will be said that all colleges have this same obligation to democracy. It is true. Unfortunately there are those who "indict the college as not having contributed enough to the cause of democracy" and who say that "many of our best trained university men are the foes of every democratic influence in the land." I should like to urge the most careful reading of a remarkable appeal to the college men of America. It is contained in the "Outlook" for October 24 last, and is entitled, "The College in a Democracy: Is It a Failure?" It is the report of what must have been a most stirring address to the students of Wesleyan University a few weeks prior to its publication, by Professor F. M. Davenport of Hamilton College. Let me pick out some pregnant sentences.

"The American democracy has, at least in crises, been eager to avail itself of the disciplined thinking and guidance of highly educated men. * * * But it is inevitable that in the stern process of overhauling all the institutions of democracy, particular attention should be paid to the college because it is a vital institution of the Republic. * * * The college as an institution has no more kept pace with its possibilities in America than democracy has kept pace with its possibilities. * * * The trouble seems to be, in all ranges of effort, to find anything like a sufficient number of expert leaders of integrity and initiative, without whom nothing works in a democracy. * * * The present situation is the greatest challenge to the institutions of education which has ever come in the history of the world. * * * The protection against the mob spirit, against all forms of false democracy which may arise, is from this time forward to be sought in the development of highly trained men of conscience, sympathetic with democracy, who can think and can lead the people to act upon the thinking." (And he might have added, who can help patiently and sympathetically the people to do their own thinking.) * * * "Democracy never so much needed men who can think, who can keep a little in advance of the rapidly expanding mind of the world."

A FEW SUGGESTIONS MAINLY WITH REFERENCE TO RURAL AFFAIRS

Before concluding, may I record very briefly a few suggestions looking toward the immediate application of some of the principles we have been discussing, with special reference perhaps to the agricultural situation?

1. Can we not help interpret the war to our constituency? Surely this is a legitimate and highly important educational function. Perhaps we can even assist our people in keeping that sane balance that is so essential in these times. Should not even a democracy learn the difference between fiery patriotism and Prussianized bullyragging?

2. To mobilize so gigantic and unorganized a thing as American agriculture for a sharp crisis is an herculean task. Most creditable work has been done the past season. But the farmer has been distracted by advice from many sources, some from men whose knowledge of the problem was far short of their good intentions. The farmer has had almost literally to hoe his own row. He has lacked representation in responsible administrative groups. We still lack a comprehensive program of food-

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supply. There is today no place to go, so far as I can discover, for a clear-cut plan for handling the national food supply as an integrated whole from seed-sowing to bread-eating—no high official, no department of government, no authorized group of experts, no organization, no correlating body is the leader. We need an agricultural general staff—a small group thoroughly representative of the farmers as well as of public agencies and fully responsible for a national program of food supply. Should we here not help to secure such a group?

3. The National Service Handbook, in the issue of July 30, after printing a quotation from President Wilson "urging colleges and technical schools to endeavor to maintain their courses as far as possible on the usual basis," recites the need during the war of doctors and of chemical, electrical and mining engineers and says:

"The food situation will necessitate increased attention to intensive cultivation and the most modern and productive methods of scientific farming."

It makes no reference, however, to the need of trained agricultural experts in this emergency.

Up to this time no place has been provided in the scheme of things for either "officers" or "privates" in agricultural war service. Apparently the only assured channel for war service for the agricultural college student is in the army, and that, too, irrespective of whether or not he has gained his graduating diploma. Perhaps this is as it should be. I am not complaining because our students have to go to war. Indeed I have a feeling not only of intense admiration but even almost of awe for these magnificent fellows who have cast all personal issues to the winds and rallied to the the colors. But I am desperately, perhaps peevishly, anxious that our institutions shall make our most effective contribution to the emergency. What is the best thing that an agricultural college man can do for his country? So I wish we had a policy. I wish I could tell my own boys just what the Government wants of them, all of them, and when it wants them. I repeated to them last spring the aphorism that was going around to the effect that helping to procure food is really a most honorable war service. I do not say that any more—for there is no place provided. Oh, no, it is not a matter of keeping our boys away from danger. The appeal that came during the summer of 1914 to Oxford men in England now rings in the ears of American students. Listen! I quote from the booklet, "British Universities and the War."

"Eleven thousand old Oxford men have passed into the service of their country. Over 1,400 have already fallen; 100 more are missing—1,500 in all, among them many of the best scholars, the finest athletes, the leaders of their years. * * * Colleges which before the war contained 150 now contain half a dozen. Emptiness, silence, reign everywhere. * * Yes, they are gone. They are all gone. That is what war means to a country. If its fields still stand unravaged, its walls erect, it is at this price—to have sent out all its healthy young men—all, all. * * * Many Americans, young and old, knew Oxford of yore. Let them realize her as she is now, her buildings tenantless or turned to strange uses, her true life reduced to a memory, a dream, a hope! Let them realize this and ponder what it means!

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Old Oxford's walls are gray and worn,
  She knows the truth of tears,
But today she stands in her ancient pride
  Crowned with eternal years.

Gone are her sons; yet her heart is glad
  In the glory of their youth,
For she brought them forth to live or die
  By freedom, justice, truth."

Is it for us also to pay such a price for world righteousness? If it is, we will do it, we will do it. But we want to know.

4. A few moments ago I said, regarding research, "that we still have too much faith in knowledge of the physical and biological facts and principles as all sufficing." These remarks are not to be construed as belittling research in the physical and biological sciences. On the contrary, the time has now come, in my judgment, when the American system of scientific investigation in the field of the production, the distribution and the conservation of food should be vastly enlarged in scope and in financial support; much more completely coordinated in its relationships of agencies and personnel; and fully committed to work of the most fundamental character. The same considerations apply to engineering. A democracy that fails to support the quest for full knowledge of its problems can never develop its full efficiency.

5. We need to be planning now for a more efficient rural democracy. Programs or objectives should be outlined, methods of studying resources developed, plans of improvement suggested, schemes of organization settled. The relation of agriculture to the food supply in America and in the world at large is the first consideration. But the human relationships, the country life problem, should not be neglected and might indeed become the study of a special group of people. I wish this Association might take steps at this time at least to pave the way for the early organization of a committee or group of men and women, who could begin very soon, quietly, but in a whole-souled and authoritative fashion, to consider the problems of agriculture and country life that we shall have to meet when the war is over. We never had a greater opportunity for service than to help launch a plan for considering the big rural issues of the coming time and how they may be prepared for intelligently and thoughtfully.

IN CONCLUSION

All the members of the national sisterhood of colleges and universities represented here tonight gained their federal charters on a day when this Republic was in the throes of the most stupendous civil war of history. The years have passed. The wounds of civil strife have healed. Today a Nation that knows no sections is rallying around one flag, pouring out its possessions, dedicating its sons and consecrating its talent to a noble and effective part in the most gigantic war the world has known. The Morrill Act institutions were conceived in the profound idea that a free people needs the aid of the highest education, the loyal service of the trained man: may they now rise to the full measure of devotion to democracy's highest ideals, as those ideals become the pillar of cloud and of fire that the nations must follow into the promised land. These colleges had their birth at a time of supreme struggle for national unity: in this day of

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murderous strife, which we hope and pray may eventuate in a larger world unity, may they be reborn into a new and an enlarged consecration to the fundamental needs of a progressive, outreaching, world-wide, Christianized democracy!

At this point the President assumed the chair.

THE PRESIDENT. The next item on the program is an address by one who knows agricultural problems from the standpoint of the sympathetic and profound student of those problems. I take great pleasure in presenting to you Prof. T. N. Carver of Harvard University, who will speak on "The Farmer's Income as Affected by the War."

THE FARMER'S INCOME AS AFFECTED BY THE WAR

BY T. N. CARVER

This program might be called a design for the development of omniscience. My distinguished predecessor on this platform, an agriculturalist, has given a profound address on economics, such an address as I wish I were able to give; whereas I, a mere economist, am expected to give an address on an agricultural topic. If I can succeed as well out of my field as he did out of his, I think the makers of this program can claim to have done something towards the broadening of the education of both of us.

I shall assume to begin with that our farmers, like all other right minded people, would rather belong to the goodly company of those who are bearing uncomplainingly the terrific burdens of this war than to the indecent company of those who are prospering because of the war or squealing because they are not making as much out of it as they would like. I shall assume that they agree that it is indecent to prosper while the whole world is suffering and that if prosperity is forced upon one by economic conditions, the presumptive disgrace can only be wiped out by the most austere and frugal living and the devotion of every dollar of one's income and every ounce of one's energy to the national service.

In beginning the discussion of the effects of the war upon the farmer's income, I find it necessary to define the farmer's income and to treat it under three heads:

1. His gross money income. 2. His net money income. 3. His real income.

I find it necessary also to consider the farmer's income as coming from two sources:

1. The sale of the primary products of his soil. 2. The sale of secondary products of his business.

Again, I find it necessary to distinguish between the incomes of various classes of the farming population:

1. The farmer as a business man. 2. The farm laborer. 3. The farm owner.

By the farmer's gross money income I mean merely all the money which he takes in in the course of the year. Obviously, this is of little importance, because it is no indication of his prosperity. By his net money income, I mean the money which he has left as the result of the year's operations after he has paid the actual business expenses of his farm. He must not deduct, however, the running expenses of his household. That is, we must make a sharp distinction between the business expenses of running the farm

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and the cost of supplying the farmer's family with the necessaries, conveniences and luxuries of life. His net money income, as suggested above, is found by deducting from his gross money income the business expenses of running the farm. His real income, however, is the number of things which he can provide for his family in the way of necessaries, conveniences, luxuries, etc. Even though his net money income may increase, his real income, or his prosperity, may not increase if the cost of these consumers' goods rises correspondingly.

Let us consider first the way in which his net money income appears to be affected by the war. It is in this discussion that the second of the above distinctions becomes important. The proceeds of the sale of the principal products of the soil may yield him a larger profit, and in so far as his income is derived from these sales his income would be increased; but the farmer is sometimes the producer of secondary products, that is to say, he is a kind of manufacturer who uses up one class of products in the production of another class. When he grows corn and sells it he is selling a primary product of the soil. When he feeds that corn to hogs or cattle he is selling a secondary product in the form of pork, beef or milk.

The three principal staple crops, corn, wheat and cotton, belong in the class of primary products of the soil. Let us consider the condition of the corn, wheat or cotton farmer with respect to his net money income. The simple fact that these products are bringing higher prices than formerly would indicate higher incomes for the farmers unless these higher prices are offset by corresponding increases of cost. For the time being I must ignore the difference in the labor cost, partly because a majority of the corn and cotton farmers and a fair proportion of the wheat farmers do their own work, and if the labor cost is increased they are merely getting higher wages for themselves. In the second place, even though they pay wages to hired help, the hired man is part of the great farming population and the total income going to the total farming population would therefore be increased even though some classes of the farming population prospered out of proportion to the others.

According to the Crop Report of the United States Department of Agriculture for November of the present year, the country price of corn on November 1 was $1.46 per bushel as against a five-year average price on November 1 during the years 1911-1915 of $0.653. That is, the country price on November 1 of the present year was 2.2 times as high as it averaged on the same date from 1911 to 1915. The price has fallen somewhat since November 1.

The country price of wheat had increased during the same interval on the same dates from $0.885 to $2.00 per bushel. The price was a little more than 2.2 as high on November 1 of this year as it averaged on November 1 during the five-year period from 1911 to 1915.

The country price of cotton, on November 1, 1917, was $136.56 per bale as against an average price of $50.50 on the same date during the five years from 1911 to 1915. This would make cotton sell for 2.7 times as much on November 1 of this year as during that five-year period. It must be said, however, that this five-year average is considerably reduced by the abnormally low prices prevailing November 1, 1914, when the bottom had dropped out of the cotton market. But after making all allowance for this low price, the present price is at least twice as high as it averaged during the five-year pre-war period.

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In the case of the corn farmer, what evidence is there that there has been an increase in the cost of production sufficient to offset the increase in price which the farmer is getting? The principal items in this possible increased cost of production would be machinery and fertilizer. Farm machinery has gone up somewhat, particularly tractors, but even in the case of tractors the price has not doubled in the last three years. The farm price of corn has approximately doubled. Taking all classes of farm machinery and tools which are used in the process of corn growing, I can find no evidence of a hundred percent increase on the average. Besides, the total machinery cost in corn growing forms only a small fraction of the price of corn. As to fertilizers, the bulk of the corn crop, particularly in the corn belt, is grown without commercial fertilizer, animal manure and clover crops being the principal methods of maintaining soil fertility. In so far as animals are fed at a loss, a part of this loss might perhaps be charged in the form of a higher cost for the animal manure which goes back into the soil. To what extent livestock is kept at a loss will be considered in a later paragraph.

The corn farmer, in the East, however, who has to fertilize pretty heavily, has had a notable increase in the cost of production, but apparently the cost has not quite doubled. As nearly as I can figure it out, the price of fertilizers has increased about 60 percent, although I suspect that further analysis might show that there has been a deterioration in quality. Allowing 75 percent for the increase of the price of fertilizer would still leave the farmer some increase in the income, and in the case of those who do not use commercial fertilizer there would be no added cost of fertilizer to offset the higher price of corn.

In the case of wheat, the advance in price has not been quite so great as in the case of corn. The advance in the price of farm machinery is a little greater and his machinery bill is a little larger than that of the corn farmer. As in the case of corn, the bulk of the wheat crop is grown without commercial fertilizer, although the farther one proceeds east of the Mississippi River the more largely does the fertilizer question enter in. And much the same can be said here as in the case of fertilizer in the production of corn. The machinery bill of the wheat farmer is a little higher than that of the corn grower and yet his machinery has not quite doubled in price during this period.

The case of cotton is comparable to that of wheat. The price of cotton has practically doubled and in that part of the cotton country which lies west of the Mississippi River, there is nothing adequate to offset this advance in price.

The ravages of the boll weevil can hardly be attributed to the war. They would have taken place if the war had not happened and in addition to that the price of cotton undoubtedly would have been lower than it now is. In the eastern portion of the cotton belt the cost of commercial fertilizers has risen. But there is a close connection between the cost of fertilizers, particularly nitrates, and the price of cottonseed meal. And there is likewise a close connection between the price of cottonseed meal and the cotton seed as the farmer sells it. So for every increase in the price of chemical fertilizer there has been an increase in the price of cotton seed. Therefore, for every loss which the farmer incurs in the cost of chemical fertilizer he is compensated by an increase in the price which he gets for his cotton seed. Balancing, therefore, the price of his cotton seed against

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the cost of his chemical fertilizer he still has the advance in the price of lint cotton as a profit.

That which is true of these three great staple crops, corn, wheat and cotton, appears to be in the main true of most of the minor crops, though there may be some exceptions. Therefore, the farmer who is selling the direct and immediate products of his own soil is undoubtedly better off today than he was before the war.

To what extent is this advance in price with the consequent increase in prosperity the result of the war? In the case of the corn crop there could be no possible question. The crop is larger and the price is higher. There might be some possible question in the case of wheat. Though this year's crop is slightly greater than last year's crop and the price slightly higher, still this year's crop is not up to the five years' average from 1911 to 1915. It might be claimed, therefore, that the present high price of wheat is not so much due to the European war as to the shortage in the crop. This crop shortage is undoubtedly one factor in the problem, but there are other large factors which we can hardly afford to rule out. For example, the largest wheat growing area in the world, outside of the United States and Canada, is Southern Russia. For a number of years past Italy and Switzerland have depended almost entirely on this area for their supplies, and France and England to a certain extent. The closing of the Dardanelles and the Baltic has shut Western Europe off from this supply and made her dependent mainly upon the North American area. The Swiss government has made it clear that unless they can get supplies of grain from North America her people must go hungry. In addition to this, we have to consider the enormous increase in the consumption of wheat flour in the feeding of armies, and a certain percentage also as having been sunk by the U-boats. With these large facts before us we can hardly avoid the conclusion that the war itself has contributed a large share to the advance in the price of wheat; that it cannot be entirely accounted for by the shortage in the crop in this country. In the case of cotton we also have a slight shortage as compared with the five-year average from 1911 to 1915. Moreover, we do not have any large cotton growing area cut off from the world's markets as happened in the case of wheat. The world is mainly dependent upon the crop of the United States. But we have to consider, however, the enormous demands upon the cotton crop for the manufacture of tents and other military supplies and particularly the use of cotton in the manufacture of high explosives. There is also the fact that a certain percentage has been sunk or destroyed by our enemies. As in the case of wheat, so in the case cotton, we are compelled to conclude that a part of the increase in price is due to the war and cannot be wholly accounted for by the shortage in the crop.

When we come to consider the secondary products of the farmer's business, such as beef, pork and dairy products, the case is by no means so clear. In so far as beef is produced from grass which would be salable in no other form, the beef grower, of course, sells his grass at a higher price than formerly. In this respect beef would resemble a primary product of the soil. But in so far as beef is produced from high priced corn, the question is different. Apparently it is not profitable to feed high priced corn of the best grade for the purpose of making beef. On the other hand, it must be pointed out that there is a great deal of soft corn, not salable, or at least not salable at the highest quoted prices. If this can

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be sold in the form of beef and in no other form, and if the farmer can realize a good price for his beef, he is then getting a good price for his soft corn. The soft corn cannot be considered to be the result of the war. The weather and the other conditions would have been much the same, war or no war. If the farmer had had to sell his soft corn in the form of lower priced beef, he would have grown the soft corn anyway and would have received a lower price for it. Here again the beef producer is getting a good price for a product which otherwise would not be salable.

Much the same consideration applies to pork as to beef. A certain amount of pork is made from grass, though not so large a percentage as is true in the case of beef. If we might divide the hog into two parts so that a part of his weight is made from grass and a part from corn, we could then say that that part which is made from grass is highly profitable because the farmer sells his grass at a high price. If, however, in order to make that part marketable, the other part which is made from corn is produced at a loss this would tend to offset or to cancel whatever profits were made on the grass. It would be an interesting problem to work out, but it would require a large organization and a good deal of time to accomplish it, if we could actually determine to what extent the loss on the corn counterbalanced the gain on the grass. In case it is soft or unmarketable corn, which otherwise could not be marketed at all, the case is clear—there would be no loss to compensate for the gain.

In the case of dairy products the problem is still more complicated, particularly in the northeastern sections of the country where dairying is one of the leading farm operations. A large proportion of the milk produced in the Northeastern States is made from various grain feeds. The prices of these feeds have risen more rapidly than the price of milk. If the farmer had no other alternative but were compelled to use these grain feeds in the same proportion as before the war, he would be producing his milk at a loss. But the beneficent agency here is grass. Some milk is made from grass and whatever rise in the price of milk has come merely enables the farmer to sell his grass at a better price. In the western dairy regions this is a factor of more importance than in the eastern, because a larger proportion of western milk is produced from grass than of eastern milk. However, the eastern farmers have one resource, namely, hay. The hay crop in the Northeastern States for the last two years has been good and its price has not risen perceptibly. The result is that the dairy farmers are feeding more hay and less grain. They are getting less milk, but such milk as they do produce is produced more cheaply than it would be if produced on grain alone. They who are so situated as to feed hay mainly are probably coming out even, that is, the slight advance in the price of milk is compensating them for the advance in the price of feed. Those farmers, however, who are not so situated as to be able to take advantage of cheap hay and are compelled to feed grain rations are undoubtedly losing money.

It was pointed out in the discussion of farm machinery and commercial fertilizers that these products were produced by a non-agricultural class, and that any additional price which had to be paid for these products would have to be called cost rather than income to the farmers. In the case of feed, however, that which is cost to the producer of pork, beef or milk is income to another class of farmers. If beef, pork and milk bring higher prices, more money is going to the farming class as a whole. If

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the cattle feeder is losing money it is not because the price of his finished product is low, but because he is compelled to pay some other farmer a high price for corn or still another farmer a high price for feed stock. In other words, this is a problem of the distribution of the agricultural income among different classes of farmers. It may be cold comfort to the New England dairyman to tell him that the money which he loses is going into the pockets of other farmers. It is quite possible that he would not feel any more comfort over this fact than if he were told that it went to some non-farming class. In short, we cannot reach any very valuable conclusion by discussing the farm population as a whole, though we may state for whatever it is worth that the farming population as a whole is undoubtedly enjoying a larger net money income because of the war.

Much the same consideration would apply to the cost of farm labor. If one assumes that farm laborers are members of the great farming class and that, man for man, the farm laborer is entitled to as much consideration as the farm owner, then one could say that even though the high price of farm products went mainly to increase the wage bill it is still increasing the total income of the whole farming class. If the farm operator is losing money it is because he is paying another part of the farm population, namely, farm laborers, a very high price for what they have to sell. This case would be exactly parallel with the case of the cattle feeder who loses money because he pays so high a price for his corn or for his feed stock.

If we attempt to distinguish among the different classes of the farm population the conclusion is forced upon us that the farmers who grow the primary products of the soil and sell them for cash have a larger net money income than they would have had if the war had not come. Those members of this class who are not compelled to buy high priced fertilizers have made much larger profits than those who are compelled to buy fertilizer, but even the latter have to some extent prospered, that is, the cost of their fertilizers has not risen sufficiently to entirely offset the high price of the products which they sell. The case of the animal husbandman and dairyman, producers of secondary farm products, is not quite so clear, but in so far as they are selling grass, hay, soft corn and other products which either are not salable or have not risen in price, even they are gaining because the high price of cattle, hogs and milk enables them to sell this grass, hay and soft corn at a better price than they would otherwise be getting. On the other hand many of those who are feeding sound and salable corn or other high priced feeds are producing at a loss and even those who are so favorably situated as to produce at a slight profit are very near the margin.

We now come to the question of the farmer's real income. In the case of those whose net money income is generally diminished, or not perceptibly increased, there is no question that their real income is positively diminished, for the things which they have to purchase to supply their families have generally risen in price. In the case of those whose net money incomes have positively increased, as the corn, cotton and wheat farmers, the question is, have the things which they have to buy for their families increased sufficiently to absorb all this increase in net money income? I do not think that they have. There are at least two large items that have not increased at all. One is a mortgage debt. The farmer who was in debt at the beginning of the war has not found that the debt has

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increased because of the war. If he has gone further into debt it has been for some reason entirely independent of the war. Assuming that his debt would be what it is, war or no war, I merely maintain that he will find it easier to pay his debt because of war prices than he would find it if he did not receive war prices. In the second place, there is that considerable list of consumers' goods which are grown on the farm and not purchased at all. In a sense, of course, if he consumes milk, butter, eggs, poultry, garden vegetables and pork grown on the farm, he is consuming something which he might have sold at a higher price, but in considering items of this kind we should consider merely the cost in human energy of growing them. If the farmer gets less mental satisfaction from the consumption of butter which he might sell at a very high price than he would from the consumption of butter which he could only sell at a loss, I am not disposed to agree that his living is really costing him any more.

Take another large item in the cost of living of many prosperous farmers, namely, automobiles. There has been a considerable increase in the price of automobiles in the last three years, but I know of no standard make that has doubled in price unless there has been a considerable improvement in its size and quality. That is, one can get as good an automobile today for $1,500 as he could get three years ago for $1,000. In the case of the corn, wheat and cotton grower his net money income has increased at least 100 percent, whereas the cost of his automobile has increased not more than 50 percent. I cannot find any evidence of a 100 percent increase in standard groceries or clothing except in those cases where the price goes pretty directly to some farmer. In short, counting the large proportion of the farmer's living which he grows himself, counting his debts and his ability to get out of debt as a factor of the problem, and taking the general price of the things which he is compelled to buy, I think there is no doubt that the grower of the primary products of the soil is able to live as well as he lived before the war and still save money or to live better than he lived before the war if he is content to consume all his income.

Of course, the question may be raised, whose business is it if the farmer has prospered? Hasn't he the right to prosper? To this I can only say that this is no time to talk about rights, wrongs or grievances. The only things worth talking about today are obligations. Because some one else is shirking his duty, furnishes the poorest kind of justification for me if I shirk my duty. If the other fellow is shirking his duty it is my business to get after him and not to insist on shirking my own duty or justifying myself because I am not as great a sinner as the other fellow, and from this point of view I cannot see that the grower of the primary products of the soil has any grounds of complaint, even if he was disposed to complain; with the exception, of course, of northeastern dairymen, and in the case of those dairymen it is dependent on high priced feed. It is not good for the Nation to have him, depleted in capital, go on producing milk at a loss. Sooner or later, he will quit producing milk. He should have a high enough price to keep him going and not allow his herds to run down.

Now, another question, which arises at once, perhaps I should not discuss here. All through the reading of this paper I have had an uneasy feeling that I was not talking to farmers at all. But, still, it may be even better to talk to people who themselves talk to farmers, and I presume there are a good many here who have that opportunity.

I do not think that I could really treat this subject adequately without

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saying something about what the farmer ought to do with his prosperity, his surplus income. My distinguished predecessor on this platform preached a little and I think that serves as an excellent excuse or example for me to follow. I feel just a little disposed to preach on this subject.

I have seen in various parts of the country placards in store windows and elsewhere, urging people to buy. "Business as usual. Beware of hysteria and false economy. Money breeds money"; all that sort of sublime idiocy. We are facing a situation more serious, perhaps, than any of us, even the most pessimistic, realize. We shall probably, before we are through with this awful business, have to put something like five or ten million men in the battlefield and it is up to us to supply them with the means of fighting. No question but they will fight! These young fellows that we are sending over there do not lack courage. They will fight. They will sacrifice. They will die, if it is necessary. But it is simply up to us to see that they have a fair chance, that they have the ample means with which to fight. Suppose I go on spending my income as usual, buying as many things as I bought before the war; then it will take just as many men to produce for me as it took before the war. And if you do the same and if everybody does the same, it will take just as many people to produce these things that we have been buying as it took before the war; and where are we going to get that five or ten millions of men and the other five or ten millions to produce munitions and things of that kind? There is only one way we can do it and that is to take them out of the unnecessary industries. Now, get that perfectly clear in your heads and preach it in and out of season to the farmers, because they are going to have a lot of money to spend and they are going to be under temptation to follow this false advice to buy largely. That means that it will take more people to serve and produce for them than it took before—not simply as many, but more to produce the things that they want to buy than it took in time of peace. In other words, they will be bidding against the Government to get men; for every time you buy an unnecessary article of luxury you are bidding for a man to produce it and you are bidding against the Government who wants men. I would not call it treason. Of course it is not intentional. It is just ignorance, that is all. But sometimes ignorance produces about as bad results as positive malice.

Now, I think that that probably is the most important point that can be made in connection with the farmer's income. What is he going to do with this prosperity? Is he going to use it to bid against the Government to get men and material which ought to be going to support these fellows that we are sending across to the trenches? If there is an unnecessary industry, one that is not needed to keep us efficient and enable us to carry on our regular work at home, and that continues, it is a source of weakness rather than of strength. Just so much effort is withdrawn from the potential energy which might be devoted to the winning of this war. Therefore, economize to the bone. That is the only sound economic rule for consumers, especially farmers and others whose incomes are increased by this war—economize to the bone; turn that money over to the Government in some way.

If instead of spending money myself to buy some luxury, I turn it over to the Government, the Government will use it for me in purchasing the safety of democracy. If you call that a luxury, let us prefer that kind of luxury to the kind of husks with which we have been feeding our bellies.

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One way by which we might be compelled to cut down our purchases somewhat and thus leave more energy available to serve the needs of the Government, is through rather heavy taxation. If we really want to win this war let us ask to be taxed, let us ask the Government to take our money and spend it for the things which are necessary to the safety of the world and all that we hold precious. And when you talk to farmers I hope you will appeal to the very best that is in them. That is one way to show confidence in the people, to have faith enough in them to believe that they can be appealed to on their higher, rather than on their baser, motives. It nauseates me to see how many blatherskites there are over the country who are comparing themselves with Lincoln. There is one essential difference; you never find anything in his addresses or speeches that does not appeal to the very highest human nature. He does not appeal to class prejudice. He does not speak to one class of people about the sins of somebody else, but he lays the obligation upon them to whom he is talking; and he had faith enough to believe that they would respond to their own obligations when they were presented. Have faith enough in the farmers to believe that they will see this point, and that they will respond to the obligation not only to economize but to pay taxes. It does not do the farmer any good to vote taxes onto somebody else. In the economy of this universe nobody does any injury to anybody but himself when he tries to shove a burden off onto somebody else. In the interests of the farmers themselves, ask them voluntarily to vote high taxes upon themselves, not upon people of large incomes. Everybody who can spare a dollar ought to be made to spare it in order that that money may be spent by the Government in the interests of democracy, rather than be spent by the individual himself on some unnecessary luxury.

That other attitude, that other basis of appeal, where you appeal to the baser element of human nature, shows a contempt for the very people to whom you are speaking. If you think that the people to whom you are speaking will be appealed to by an argument to vote taxes on somebody else, that means that you have a very poor opinion of them; you think that they are slackers themselves. But if you think that they are willing to "stand the gaff," to assume the burden and to do what they obviously ought to do in a case of this kind, then you will be showing some appreciation of their quality and I believe in the long run that it will be more effective than the other kind of appeal, although the other may get up a little instantaneous fury. That is not what is going to win this war, it is having men who will stay with it to the end. You can only get men to do that by appealing to the ideal in their natures. Democracy? Well, democracy means a good many things to a good many people and it sounds sometimes as if it meant to some people that everybody ought to do exactly as he pleases, Government or no Government. Well, you cannot make the world safe for that kind of democracy. This world is so constituted that it is an unsafe place for that kind of human ideal, and it cannot last; and it ought not to last, because it is unfit to last anywhere, in any kind of a world.

THE PRESIDENT. The Chair appoints the following persons as members of the committees stated for three years.

The committee on instruction in agriculture: A. C. True of Washington, D. C. and T. F. Hunt of California; G. A. Works of New York (in place of H. J. Waters of Kansas, resigned [for two years]).

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The committee on graduate study: H. P. Armsby of Pennsylvania and Eugene Davenport of Illinois.

The committee on college organization and policy: Samuel Avery of Nebraska and W. M. Riggs of South Carolina; C. A. Lory of Colorado (in place of C. A. Dunlway of Wyoming, resigned [for one year]).

The committee on experiment station organization and policy: Eugene Davenport of Illinois and C. D. Woods of Maine.

The committee on extension organization and policy: W. D. Hurd of Massachusetts and H. L. Russell of Wisconsin.

The joint committee on projects and correlation of research: J. G. Lipman of New Jersey.

The joint committee on publication of research: Raymond Pearl of Maine.

T. F. HUNT of California. There lies to the north of us a country which has known what war is. During the past three years it has put into the trenches a body of soldiers that would be equivalent to our enlistment of 5,000,000 men and has spent a sum of money that would be equal to our spending $40,000,000,000. We have often welcomed Canadian visitors at our conventions and are especially privileged this year in entertaining several. I move that to these gentlemen be extended the privileges of the floor of this Convention.

The question being taken, the motion was agreed to.

On motion, a recess was taken until 9 A. M., Thursday, November 15.

MORNING SESSION, THURSDAY, NOVEMBER 15, 1917

The Convention was called to order at 9 A. M. by the President.

THE PRESIDENT. The chairman of the Executive Committee is recognised.

REPORT OF THE EXECUTIVE COMMITTEE

The Executive Committee begs leave to report the following items:

1. A paper presented by a committee from the Association of Commissioners of Agriculture outlining a plan of operation and defining the relations proposed between the several state agencies and the United States Department of Agriculture.

PROPOSED FIELD OF WORK OF DEPARTMENTS OF AGRICULTURE

GENERAL DENOMINATION

CONTROL, REGULATION AND ADMINISTRATION

TYPICAL LINES OF WORK

I. Control and regulation.
   1. Live stock sanitation.
      A. Quarantines.
      B. Control of outbreak of diseases.
   2. Plant disease regulation.
      A. Orchard and nursery inspection.
      B. Control of outbreaks.

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3. Dairy and food control.
4. Seed inspection.
5. Feed and fertilizer inspection.
6. Stallion enrollment.

II. Administration.
1. State fair.
2. Immigration anl colonization.
3. Agricultural statistics.
4. Markets.

NOTES

I. Promotion of control projects.
1. Cooperation with Agricultural Colleges and Stations through existing extension service machinery in promoting constructive control projects before the people of the State.

II. Transfer of functions.
1. Departments now handling various forms of education and extension work are to transfer the same as soon as circumstances permit; likewise stations are to transfer regulatory functions now located with them.

III. Selecting and appointing commissioners.
1. Following the success which has attended the establishment and development of State Agricultural Experiment Stations and Colleges through the standards and methods used in selecting and appointing directors and deans by Governing Boards of Regents and Trustees, it is advocated that some similar method be adopted in each State for the selection and appointment of Commissioners of Agriculture.

IV. Office of States Relations Service.
1. Because of the interrelation of the Stations, Colleges and Departments of Agriculture in respect to the United States Department of Agriculture, an organization connecting the State Departments of Agriculture with the National Department of Agriculture similar to the form of organization now serving this relationship between the Stations, Colleges and the United States Department of Agriculture would be of great value and should be established for carrying on this interrelated and cooperative work between the State and National Departments of Agriculture.

Recommended by the National Association of Commissioners of Agriculture; Committee on Field Work:

CHARLES WILSON, *President,*
C. P. NORGORD,
ALVA AGEE,
FRED W. DAVIS,
WILFRID WHEELER,
Committee.

The Executive Committee recommends the approval by this Association of the above statement as a plan of organization policy, with the added suggestion that when the plan has been approved by the National Association of Commissioners of Agriculture, arrangements be made at once in the several States that the appropriations shall follow the method proposed in the plan of organization hereby approved.

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9. The Executive Committee recommends that for the coming year the dues be the same as last year, namely, $35 for the colleges and $20 for the stations.

THE PRESIDENT. The question is first on the recommendation touching the proposed cooperation between Boards or Commissioners of Agriculture and the Agricultural Colleges in the several States.

W. M. RIGGS of South Carolina. I foresee in the adoption of the first recommendation the raising of questions which in some States have been settled. The regulatory functions which the resolution would delegate to the Commissioners of Agriculture are now carried by several of the Southern Agricultural Colleges. They have held that such regulatory work was closely associated with their educational activities and have vigorously opposed the efforts of Commissioners of Agriculture to secure it. I would certainly be loath to see this change brought about in my own State.

On motion, the recommendations of the committee were adopted.

On motion, pursuant to the request of the section on experiment station work (page 249), the address by Dr. Graham Lusk before that section was ordered printed as a separate (see, in this connection, pages 160 and 161).

THE PRESIDENT. The second section of the report of the committee on college organization and policy will now be presented by President W. M. Riggs of South Carolina. (For Section I, see pages 35-36.)

REPORT OF THE COMMITTEE ON COLLEGE ORGANIZATION AND POLICY
SECTION II

The war has made acute many phases of the policy and organization of our institutions. Some old questions of relationship have taken on new forms and new problems have arisen. The ordinary internal administrative machinery in some instances has been thrown out of gear and the emergency has also developed a new set of relations demanding decisions that may affect permanent as well as temporary policies. Therefore your committee has felt it incumbent upon it to call attention to some of these more pressing problems. We are aware that some of the subjects touched in this report are to be discussed at length in the program of this meeting. This fact all the more urges us to place before you some considerations that we think should be kept in mind as the discussion proceeds. Many fruitful suggestions have come to us as the result of some recent correspondence with a number of members of this Association.

I. WAR EMERGENCY LEGISLATION

The Food Production Act, frequently referred to as the Food Survey Act, providing funds for the United States Department of Agriculture, and the Food Control Act establishing a national Food Administration, have raised certain questions concerning the relation of the Colleges to the

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Department of Agriculture on the one hand, and to both national and state food administrators on the other hand, as well as suggesting certain problems of coordination of all.

An unfortunate feature of this legislation was the long delay on the part of Congress before the bills were passed. As a result, the agricultural production of the past season has been scarcely influenced by this legislation. But for the existence of a fairly well organized and correlated piece of machinery in the States Relations Service of the Department and in the extension service of the colleges and farm bureaus, American agriculture could not have been mobilized even to the extent that occurred.

The Food Production Act aims "to provide further for the national security and defense by stimulating agriculture and facilitating the distribution of agricultural products." It is essentially a law to promote the gathering and dissemination of information for increasing production, preventing waste in the food supply and regulating the distribution of the food supply. It provides money for controlling diseases and pests of plants and animals, furnishing seeds, promoting food production and conservation through the county, district and urban agents, and for a survey of food demand and supply.

The title of the Food Control Act states that "It is to provide further for the national security and defense by encouraging the production, conserving the supply and controlling the distribution of food products and fuel." It is a rather remarkable fact that not only in the title but in the enacting section much the same ground is covered as in the Food Production Act, for example, "to insure an adequate supply and equitable distribution and to facilitate the movement of foods, etc." It seems clear, however, from the main body of the Act that it is essentially a comprehensive piece of emergency control legislation, although under it a very large amount of educational work, particularly in conservation, has already been started.

THE SITUATION THAT HAS DEVELOPED

1. It is doubtful if the public realizes the enormous amount of work that has been done during the past season in the mobilizing of the food supply by such bodies as the United States Department of Agriculture, United States Food Administration, State Councils of Defense, Colleges of Agriculture and County Farm Bureaus. Making and carrying out a program for the production, distribution and conservation of food in a country like America is a gigantic task and an exceedingly complex problem. Time, which is a prime element in solving such a problem, has not been available for working out large policies. Diverse interests, and some of them very self-centered interests, have had to be reconciled. Progress is being made and we shall welcome the announcement of further plans as rapidly as possible. The great cooperating agricultural and food handling organizations of the country will be most efficient when a comprehensive, intensive, unified program of food supply is before the American people. The nearest approach to such a program is a series of most admirable resolutions adopted by the conference called by Secretary Houston last April at St. Louis. However, the plan there developed, in part at least, was invalidated because the legislation that ensued did not provide for unification of policy or administration. Thus far, the college of agriculture have not been able to fit their plans into a large national food supply policy.

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2. So far as your committee is aware there has been no distinct division of labor of agencies of food supply based on function. An impression has been created that production has been left to the Department of Agriculture and its cooperating bodies, and conservation and distribution to the Food Administration. Of course, such a division is hardly consistent, because the Food Production Act appropriates over $4,000,000, at least three-quarters of which has been assigned very definitely to an educational program in food thrift; it also assigns nearly $2,500,000 more for gathering information concerning the food demand and the food supply.

3. In some parts of the country, and perhaps in some of the operations on a national scale, there has not always been adequate appreciation and use of existing agricultural agencies. In a few cases apparently they have been almost entirely ignored. Doubtless this has been due far less to design than to ignorance. Oftentimes men have been called into this service—able men, patriotic men—knowing little of the problems involved or of existing agencies and their work. In other cases there has been a failure on the part of these newly appointed officials to recognize and utilize the administrative capacity that has been developed in our agricultural educational work. Your committee feels that as the program of food supply develops it should include much closer cooperation not only among agencies but among individuals who are capable of high-grade service in this important field.

4. It is scarcely necessary for your committee to call your attention to the handicap under which farmers are often obliged to work, due to the operation of either voluntary enlistment for military service or the draft. That the result has been a hardship is platitude. How to meet the situation constructively is a question more difficult than to pick flaws in the procedure. Agriculture should bear its full share in the war, both in furnishing supplies and in furnishing men. Your committee feels that this is a subject that should have most careful study and consideration by the military authorities. All that agriculture can fairly ask is that it be given the same chance as other industries to render its full service in the emergency. One of the most serious problems that confronts our colleges in serving the Nation at this time is the assignment to military service of technically trained men who, from the standpoint of real efficiency, could render far better service if they were assigned to leadership in some food supply enterprises. In spite, however, of one's conclusions after a cold-blooded argument in this field, one has to admit a thrill of satisfaction that our students and young instructors have responded so eagerly to the call to the colors. It is certainly to be desired, nevertheless, that the Government should not endanger the food supply of next year or the coming years by drawing off unnecessarily the requisite leadership.

RECOMMENDATIONS

1. Our agricultural colleges will, of course, continue to place themselves at the disposal of the Government. It goes without saying that the administrative integrity of the colleges and their allies, the county farm bureaus, should be kept intact. We must not forget that the National and State Food Administrators are the authorized governmental leaders with respect to the emergency food supply program. On the other hand, in the interests of efficiency all responsible officials should recognize not only the function and effectiveness of existing publicly supported agencies of

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education, but that these agencies have very definite obligations to initiate and prosecute educational work that will serve the country in this emergency, not alone in the field of production but also in various forms of food conservation and in connection with the puzzling questions of distribution.

2. We recommend that this Association place itself on record in the strongest possible fashion relative to the need of unifying the effort completely to mobilize the food supply of the United States. The real problem here is to coordinate activities upon an accepted authoritative, comprehensive plan of operations. Section 6 of the Food Production Act authorizes the President to coordinate the activities of any agency or organization of the Government so as to avoid any preventable loss by duplication of work, and Section 2 of the Food Control Act authorizes the President to coordinate the activities of volunteering persons or agencies as well as any department or agency of the Government, so as to avoid any preventable loss of effort or funds. In this connection, your committee would like to call attention to the fact that the St. Louis resolutions recognize the need of such unification and recommended "additional machinery" as follows:

"A relatively small central agricultural body, whose services and presence might be required in Washington constantly, to be composed of men who have wide knowledge of agricultural matters and executive experience. In selecting these men, attention should be paid to geographical distribution.

"A large national advisory body composed of representatives of the leading agricultural agencies and associations concerned not only in production but in distributing and handling commodities."

It was supposed at the time these resolutions were passed that the Department of Agriculture would have practically full charge of food supply matters. It is quite possible that the organization of the two committees referred to just in the form suggested would not be workable at present. The spirit of the second resolution has been carried out by the Department of Agriculture, as well as by Mr. Hoover, in organizing representative groups to consider specific problems as they arise. The small continuing coordinated body has not as yet been created. Can not a way be found acceptable to both the Food Administration and the Department of Agriculture, by which a small group of representative men could be brought together for the sole purpose of unifying the program and coordinating effort in securing an adequate food supply?

Your committee ventures this further suggestion, that in order to get cooperation there are certain unities that must be recognized and planned for. The problem of food supply must be unified. Production, distribution, conservation are so intimately interrelated, both theoretically and practically, that there is really but one problem of food supply. In some way, all publicly supported agencies must be united in cooperation among themselves and with voluntary agencies in a reasonably well unified piece of administrative machinery.

3. This report has already referred to the fact that the Food Control Act places special emphasis upon control; the Food Production Act upon the gathering and dissemination of information, that is, upon education. Is this not the proper starting point for a division of labor between the Food Administration and the Department of Agriculture and its allies,

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the colleges and county farm bureaus? Unquestionably the food administrators, federal and state, must do a large amount of publicity work, because in the last analysis effective control of the food supply is fully as much a matter of enlightened public information as it is of the enforcement of drastic law and probably should be carried on by the responsible food administrators. On the other hand, the solid, continuous, prolonged task of gathering and distributing information in the fields of production, distribution and conservation of food should be left without question to the educational agencies already at work in that field. It remains only to be said that here, too, there should be correlation; that is to say, the control work, the publicity work and the educational work should be coordinated just as far as possible so that there may be a unity of attack on the whole problem of food supply.

Your committee would submit for the consideration of the Association the following resolution:

Whereas, in view of the supreme importance of securing maximum efficiency in the production, distribution and conservation of food, it becomes exceedingly important to have a definite national plan or program of food supply as well as a coordinated effort to carry out the program on the part of both voluntary and public agencies; and

Whereas, in spite of the large amount of splendid achievement already to be credited to the efforts that have thus far been put forth, nevertheless in the opinion of this Association the country should have more complete unity of endeavor; be it therefore

Resolved, that this Association instruct its Executive Committee to make such representations to the proper authorities as shall make clear the belief of this Association that steps should be taken in the immediate future to secure the desired unity of effort in this great task of mobilising the American food supply.

Be it further resolved, that the Executive Committee be instructed to keep the members of the Association informed as to the various steps taken by national officials or agencies from time to time looking toward the development of general policies affecting the entire country, particularly the agricultural colleges.

II. The Smith-Hughes Act

The passage of the Smith-Hughes Act providing for the promotion of vocational education emphasizes on a national scale some of the questions of policy and organization that had already confronted a few of the institutions in the Association in their respective States. This subject is to be a matter of special discussion on this program, but your committee will go into the matter very briefly here.

The Land-Grant Colleges and Universities are profoundly interested in the successful operation of the Smith-Hughes Act. This Act provides for a great forward step in the direction of extending a nationalized system of vocational education, a system of which the colleges represented in this Association are an organic part. The relationships between the two are therefore of vital concern to us. Our policies will be affected by the policies to be developed under this new enactment. Not only is this true, but this Association consistently placed itself on record during successive years as in favor of the principle which has been put into legislation in the Smith-Hughes Act. Unfortunately it has come to the attention of your

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committee that there is a feeling in some quarters that the Association had opposed the passage of this Act, an incorrect assumption that should be dissipated as quickly as possible.

Its passage, however, does raise a good many questions of policy and relationship. The question now before us is: How does the Smith-Hughes Act affect the policy, organization and service of the Land-Grant Colleges and Universities?

It is quite apparent that the Federal Board for Vocational Education will deal with State Boards of Vocational Education and with them alone. It will not deal with colleges of agriculture. No exception can be taken to this administrative rule. Nevertheless, we ought to know at once whether this dictum precludes conference and authoritative discussion between the official representatives of this Association and the Federal Board for Vocational Education with respect to the general policies of that board concerning the relationships between the Morrill Act Institutions and the federal system of vocational education. It would certainly be a most unfortunate situation if such an approach to some uniformity of applying the principles of comity were not available.

It seems clear to your committee that as institutions we should recognize the following general principles:

(1) That the new plan is a part of a publicly supported system of education, and in reality is merely an extension to secondary grades of the work done for many years by the Land-Grant Colleges.

(2) That while as institutions we have no authority under the Act, it is extremely desirable that Land-Grant Colleges and Universities should have representation on the State Boards of Vocational Education. This, however, is a matter to be determined by each State.

(3) That in the interests of efficiency our institutions should be fully recognized as a part of the public school system and vital to it and consequently with some very definite relations to this system. This suggestion is, perhaps, the most important of the three. There is danger that we ourselves may forget that we belong to a public system of education. The Nation and the States have gradually been building this system through the years. Moreover we must seek the wise method of bringing these different parts into an harmonious whole. To do this it is essential that the Land-Grant Colleges and Universities play their full part in the operation of the whole plan.

In the judgment of your committee, the Land-Grant College should make at least five contributions:

(1) It should cooperate heartily in the plan.

(2) It should furnish or approve the materials or subject-matter of instruction.

(3) It should train teachers and, in the judgment of your committee, it should be the principal agency for training these teachers, in so far as it is or can be properly equipped to do so. This service is vital, of course, to the work and an important function of the college. The Nelson Amendment gives warrant for this work on the part of the Land-Grant Colleges and imposes as well a distinct obligation.

(4) It should by arrangement, if not by law, have some participation in the larger policies of the system. Consequently,

(5) There should exist some cooperative administrative relationships between the two agencies. Such, for example, as obtains in several of the

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States where a member of the college department of education is supervisor or inspector of the vocational work in the field.

A SPECIAL DIFFICULTY

It is held by some who have given the matter considerable study that the Smith-Hughes Act permits and possibly encourages certain educational enterprises that are duplications of existing or projected extension work of the colleges. For example, it is expected that this new system will meet the needs of persons over 14 years of age who have entered upon or are prepared for farm life, thus challenging at once the operations of the extension work, especially for juniors. Under this Act it may be possible to put an agriculturally trained teacher in every county of the United States, to conduct extension schools throughout the county, to supervise the farm practice of every boy and man attending such schools and to train local leaders throughout the county for adult or junior extension work.

The gist of the matter seems to lie in the question: To what extent and by what methods may and should the schools or classes authorised under the Smith-Hughes Act, particularly in agriculture and home economics, do what is virtually extension work, either with boys and girls or older people? We understand that this question is now under consideration before a joint committee representing the Department of Agricalture and the Federal Board of Vocational Education. Your committee, therefore, does not attempt to pass on the merits of the question but simply makes the following recommendation:

(1) That this Association take steps at this meeting to effect such permanent relationships with the Federal Board of Vocational Education as will best assist our Land-Grant Colleges and Universities in performing their service and finding their place in the scheme of nationalized secondary vocational education.

(2) That steps be taken also to secure official rulings on such points as may be raised in connection with the possible conflict in the operation of the agencies developed under the Smith-Hughes Act, with the cooperative extension work authorised under the Smith-Lever Act.

(3) That the Association provide in the near future for the distribution of a document, covering general rulings or suggestions on points that are now at issue or that are likely to arise, in order that each one of our institutions may have some authoritative advice as to the wise and fair policies for them to follow in their own States.

III. The Smith-Lever Act

Apparently the difficulties are growing less in the actual administration of the Smith-Lever Act. There has been, in general, much good-will on the part of the States Relations Service as well as on the part of the extension directors. Probably more frequent conferences between the Colleges and the States Relations Service would still further assist in effective cooperation.

There are still, however, some unsettled questions relative to rather fundamental relationships. Many of these questions, perhaps all of them, are under discussion in the committee on extension service. At the same time many of these matters are intimately connected with general institutional policy and are not confined merely to relations between the extension

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service alone and outside agencies; such questions, for example, as where the line shall be drawn between assigning federal employees to service in the State and the use of state employees; a closer definition of the word "cooperative" in the Smith-Lever Act. The fundamental functions respectively of the Federal and State Governments under the Smith-Lever Act are matters that concern general college administration. There are also certain educational questions that belong to general college policy, such as "Is not too much stress being placed upon demonstration work as compared with other forms of extension teaching?" "Are we not making too many demands on the county agents and county farm bureaus, perhaps encouraging unjustly the transfer of educational activity from the colleges to these bureaus?" The presidents and deans of agricultural colleges are vitally interested in such questions as these.

There is also one particular problem that we feel should be very definitely called to the attention of the Federal Department of Agriculture. There are still some bureaus of the Department that apparently desire to work directly with state authorities or county bureaus or, in some cases, to carry on their own work in the various States without any connection whatever with the local agencies. As your committee understands it, the original memorandum of understanding between the Department of Agriculture and the Colleges, a memorandum signed by the Secretary of Agriculture himself, states that all relations between the States and the Department of Agriculture should come through the States Relations Service. Your committee thinks that it would be well for the Executive Committee of this Association to look into this matter, and to see if some changes may not be made in the interests of greater harmony.

A special phase of this question is the relation of the Bureau of Markets to the Colleges of Agriculture. The whole field of agricultural economics, and particularly the question of distribution of farm products, is, of course, one growing constantly in significance. The colleges in their respective States should undoubtedly be giving much larger attention to investigation and public education in this field, and the educational work should be carried out under a cooperative agreement between the colleges and the Bureau of Markets. It may require special legislation and, perhaps, eventually special appropriations to secure that cooperation in the study of these problems, and in the education of the people concerning them, that would give the largest measure of efficiency. But this cooperation should come as soon as possible.

A special question of policy in the extension service has to do with the relationship of boys' and girls' club work, or junior extension work as it is being called in some States, to the public schools and their administration. Your committee believes that in general this work should articulate closely with the local schools. It is clear also that junior extension work will reach many youths whose school days are past, and even in the case of boys and girls still in school it is probable that the Department and the College as well as the county farm bureaus can render a very great service just as they are doing now. There are problems of coordination, however, that are not yet worked out. How may the local schools, State Boards of Education, the County Farm Bureaus, the Agricultural Colleges and the Federal Department of Agriculture, so relate their work in this general field that there may be unity and effectiveness? Your committee believes that this is a question that can best be considered in conference and we

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recommend that the Executive Committee of this Association be requested to take such steps as they think necessary to secure adequate consultation with officials in the Department of Agriculture, in the Federal Bureau of Education, and, if desirable, with the Federal Board of Vocational Education, to the end that there may be developed in the near future a plan of coordination in this field of effort, and that such a plan be presented to this Association for its consideration.

In addition to any conferences that may be held by representatives of the directors of extension service, we believe that there ought to be, under the auspices of the Executive Committee of this Association, a very definite approach to the Federal Department with reference to the final settlement of such questions as those that affect the general policy of institutions.

IV. Are the Land-Grant Colleges Still on Trial?

It is just 50 years this autumn since the first of the colleges and universities, authorized by the first Morrill Act and organized under that Act, opened their doors to students. It would seem as if in that half century fairly distinct policies would have been worked out, definite administration developed and such a question as the validity of federal support for various aspects of the work of these institutions pretty well established.

And yet we find now and then statements from educational bodies which give the impression that the wonderful educational record of these institutions is not fully understood. It seems to your committee as if the time had arrived, after a half century of service, when the history of the work of these colleges should be presented to the public in a permanent comprehensive form. We, therefore, recommend that the Executive Committee be requested to report at some future meeting of this Association upon the advisability and feasibility of securing an authorized and comprehensive history of the Morrill Act institutions with special emphasis upon educational policy.

V. Engineering Experiment Stations

Your committee regards the establishment of engineering experiment stations not only as a question of fundamental importance for all time but as justifying immediate action by Congress as a war measure. Furthermore your committee believes that this Association should go on record very definitely in approval of the principle that appropriations made by Congress for this purpose should go to the Land-Grant Colleges and Universities. These institutions are called upon increasingly to meet the needs of the industries under the stress of war and to take part in the development of all phases of our industrial life. For meeting these needs the importance of engineering experiment stations can not be overestimated.

VI. Conclusion

In closing this report your committee wishes to say a word concerning the participation of the Land-Grant Colleges and Universities in the effort more fully to organize American agriculture and country life. This is a large subject but is bound more and more to come to our attention. We may at this time merely hint at some of the problems of policy involved. The colleges in our judgment should assume the whole field of food supply-production, distribution and conservation—as their field in so far as it

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relates to investigational and educational work. Consequently the colleges may be of very great assistance in helping to correlate or unify this problem and to assist also in harmonizing the interests of agriculture with other interests.

As already hinted, we are gradually developing a national system of agricultural education. We are a part of this system. Undoubtedly during the next few years it will be necessary to adjust the parts to the whole and to make such additions as may be needed to secure a complete system. Now, how can the agricultural colleges best contribute in their respective States to such a comprehensive and finished system?

The sound distinction between the control functions of administrative boards and the educational functions of the colleges is becoming more clear each year. However, there is still uncertainty and in some cases unpleasant friction between publicly supported agencies because of a lack of understanding at this point. It might be well if there could be secured in the near future a national commission on agricultural education, perhaps of a permanent character, which could assist in defining the functions of various publicly supported agencies of agricultural education and their relationships one to another.

Your committee would like to call attention to the fact that the time has come when the Agricultural Colleges should more completely assist, not only in the specific task of developing the social or country life aspect of American agriculture but also in a nation-wide movement for a full organization of those agencies that are necessary to develop and complete the rural program in the local community, in the State and in the Nation.

Respectfully submitted,

K. L. Butterfield, *Chairman;*
A. Ross Hill,
Chas. A. Lory,
S. Avery,
W. M. Riggs.

On motion, the report of the committee on college organization and policy was received and those portions which contemplated instruction by the Association to the Executive Committee and involved questions of policy were referred to the Executive Committee and made a special order for Friday morning (see page 161).

The President. The Executive Committee has provided for a very full discussion of the Smith-Hughes Act. The first speaker is Doctor Charles A. Prosser, the director of vocational education for the Federal Board of Vocational Education. Dr. Prosser will discuss the relations of the Land-Grant Colleges to the Federal Board.

The Smith-Hughes Act and the Land-Grant Colleges

By C. A. Prosser

We are on our way toward vocational education for everybody—vocational education for adults and for adolescents, vocational education of college grade and of secondary grade. The Smith-Hughes Act is only a step on the part of the National Government which reflects the trend of the movement for vocational education throughout the country.

By a system of appropriations begun during the Civil War, the National Government has secured through the Land-Grant Colleges of the

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country a system of vocational education of college grade in agriculture, in industry, and in home economics. Through the extension work of these institutions this education in agriculture and home economics has been extended not only to adults taking training of college grade but to adults in local communities, who could benefit by instruction in agriculture and of home economics of less than college grade.

By the Smith-Hughes Act the Federal Government is stimulating the several States to inaugurate a system of secondary education in agriculture, industry, and home economics, and to extend the benefits of vocational education to all those over 14 years of age. In other words, the cycle started in 1862 has now been completed so far as the National Government is concerned. While the Smith-Hughes Act involves a dealing on the part of the Federal Government with States Boards for Vocational Education rather than Land-Grant Colleges in the first instance, its outstanding characteristic is the establishment of a system of secondary instruction along the three vocational lines with which the Land-Grant Colleges have been dealing in a more advanced way for more than a half a century.

The Smith-Hughes Act is the culmination of an evolution in national appropriations for vocational education. National grants for education in America were made in the early part of the last century. These early grants were given to the States for no specific purpose, without restrictions, without administrative machinery and without the establishment of safeguards in the expenditure of the money. As might have been expected, the funds were dissipated and little, if any, results were gained.

Beginning, however, with the Morrill Act of 1862, the Federal Government has by a series of acts, the second Morrill Act, the Nelson Amendment, the Hatch Act, the Adams Act, the Smith-Lever Act, and the Smith-Hughes Act, gradually found its way to a philosophy and policy in the use of national money for vocational purposes——it might be said, for vocational educational purposes, since all of this money has been given for the stimulation and support of vocational training.

Each one of these acts has represented a climb or advancement on the part of the National Government in dealing with the problem in a more systematic and effective way. The Morrill Act imposed but few conditions in the use of the money by the States. The Smith-Lever Act imposed many conditions. It is probably safe to say that the Smith-Hughes Act is the most exacting of all these enactments in its requirements upon the States in the use of the federal money.

In the sweep of almost a century since the early grants were made by the National Government we have passed from the idea of the use of the federal money for indefinite educational purposes to the use of federal money for very specific educational purposes carefully defined in the statute. We have passed from the idea of no obligation on the part of the State in the expenditure of the money to the conception of a solemn obligation on the part of the State to use the money in conformity with the requirements of the law making the appropriation; from the idea of no machinery, no system, and no organization to safeguard and administer the funds, to the idea of a definite system, thorough-going organization, and careful safeguards in order that the federal money may be spent effectively for the purposes intended.

The problem confronted by the Smith-Hughes Act differs in a number of particulars from the problem confronted by the Morrill Act, the Nelson

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Act, the Hatch Act, and the Smith-Lever Act. In these four acts the vocational education of college grade was given by only one institution, the Land-Grant College in each State. This is true with the exception of the Southern States, where, finally, Negro Land-Grant Colleges were established as well. It was necessary, therefore, to deal in each State with the Board of Control for one institution, and to expend the money in the affairs of one institution only.

The Smith-Hughes Act, appropriating money for the support of vocational education of secondary grade in agriculture, industry, and home economics, must needs deal with many institutions of many different kinds, located in many different places—teacher-training institutions, institutions training adults in evening school, part-time schools, and day schools, institutions located in rural places, and institutions located in crowded cities. It was not possible for the Federal Government to deal with each one of these institutions directly—both because of the difficulty of the problem and because, traditionally, the elementary and secondary schools of the State are operated by the State itself. Any attempt on the part of the Federal Government to deal with them would be an interference with the autonomy of the State in the management of its own affairs. It became necessary, therefore, to establish through the Smith-Hughes Act one State Board of Control for the administration of the federal funds within each commonwealth.

The establishment of a State Board of Control as a trustee of the federal moneys in the Smith-Hughes Act made it necessary that all institutions within the State using the federal money should deal not with the Federal Board for Vocational Education but with the State Board charged with the duty and responsibility of expending these federal funds in conformity with the Act and the plan submitted by the State Board and approved by the Federal Board. This presents a new situation to the Land-Grant Colleges, and one with which, for a time at least, they will have difficulty in dealing.

They have been accustomed in the case of funds received under all other federal acts for vocational education to deal directly with some department at Washington. It is necessary for them now to recognize clearly that their dealings, their contract, their management of any scheme of training receiving federal moneys under the Smith-Hughes Act must be carried on under the rules and regulations of the State Board for Vocational Education for the State in which the Land-Grant College is located.

The Smith-Hughes Act provides the machinery, as has already been stated, of the Federal Board at Washington, of a State Board for each one of the States, accepting the Act. There was only one way by which the Smith-Hughes Act could provide for effective cooperation between these two boards. That way was to have the State Board for Vocational Education submit a plan to the Federal Board describing the way in which it proposed to use federal money for agricultural education, for home economics, for industrial and trade education, and a plan for the expending of money for the training of teachers for each of these lines. When this plan had been approved for the State by the Federal Board it becomes the working arrangement or agreement or plan and specification under which the State Board is to use the federal money.

Under this arrangement the Federal Board at Washington is concerned with only two things: First, Is the plan proposed by the State

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one that is in conformity with the spirit and purpose of the Smith-Hughes Act and in conformity with the minimum standards which the Federal Board believes should be observed in order to secure effective vocational education along any given line in the State; and, second, Is the State Board for Vocational Education successfully carrying on the plan which it proposed to the Federal Board and under which it is using the federal money in the State?

Under this working arrangement the Federal Board has no dealings directly with any institution inside the State. It does not say that a scheme of teacher-training shall be carried on by this, that, or the other institution. It cannot say this. It does pass upon the scheme for teacher-training proposed by the State, covering all such things as entrance requirements, as to age and previous experience, length of course, contents of course, method of instruction and graduation requirements. When this plan has been approved, it becomes the duty and responsibility of the State Board for Vocational Education to select some institution or institutions inside the State to give this teacher-training in conformity with the plan; and it is the duty of the Federal Board to see that the State Board does carry out this plan of training properly in the institution which has been selected.

The Federal Board must inspect the work of the institution, but not as an institution. It inspects the work as the work of the State Board being carried on by the institution.

Should the State Board fail to do this it becomes the duty of the Federal Board to withhold the allotments of federal money for the ensuing fiscal year. The State Board, therefore, takes the responsibility upon its shoulders of not only selecting the institution or institutions in which this teacher-training work is to be carried on, but of seeing that these institutions do carry on properly the work which they have undertaken to do with federal moneys.

The Federal Board, therefore, is not concerned with controversies within States as to what institution or institutions are chosen by the State Board to give teacher-training, although there is sometimes an impression abroad that this is true. This matter rests entirely in the hands of the State Board. The Federal Board is concerned only with the question of whether or not the State Board, in subletting the contract of teacher-training with federal money, has the work done according to the plan which it proposed and which the Federal Board approved.

Nor have the representatives of the Federal Board any duty or right to deal directly with the affairs of institutions using federal moneys within the States. They have no right, for example, to order changes in courses of methods, to criticize the work and the officials of the institutions. They do have a right, and it is their duty, to visit the institution for the purpose of seeing whether or not the work it is doing is in conformity with the plan; but their report, their suggestions, their criticism, their objections, are to be made to the State Board of Vocational Education as the responsible contractor on the job, and to no other.

In the light of the above statements defining the relationship of the Smith-Hughes Act to the educational institutions of a State of every grade, what is the place and relationship of the Land-Grant College to the work? In the light of the above description of the workings of the Smith-Hughes Act, what is the place and service which the Land-Grant Colleges can

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render? It hardly needs to be pointed out that the fact that the Land-Grant College is already the institution within the State where all previous federal moneys have been spent has nothing to do whatever with the question of the place and working of the Land-Grant College under the Smith-Hughes Act. The statute is entirely silent on this question. In other words, the Land-Grant College, with all of its splendid equipment and possibilities, must receive its authority and secure its appointment for the use of federal moneys under the Smith-Hughes Act through the action of the State Board for Vocational Education, which is by statute given entire power to deal with the question.

The Smith-Hughes Act provides for two kinds of training to be given by the States: Vocational education of secondary grade in agriculture, industry and trades, home economics, and the preparation of teachers to give instruction of secondary grade in these three lines.

It is apparent that, taking the problem by and large, it is not the place of the Land-Grant College to give or to control the giving of secondary instruction in the trades and industries or in home economics or in agriculture. The large service which these colleges can render—and it is by far the most important service that could be rendered—is that of the preparation of teachers, particularly in agriculture and home economics. Here these institutions have an opportunity to add to the many vitally important services which they have already rendered this country in vocational education.

As might have been expected, much of the teacher-training, most of the teacher-training in agriculture, much of the teacher-training in home economics, will be given by the Land-Grant Colleges, already so splendidly equipped in many ways for the task. The fact that these colleges are now the recipients of large amounts of money from the federal treasury for the other services which they are already rendering, imposes upon them an obligation not only to undertake the work of teacher-training under the Smith-Hughes Act readily, but to spare no effort and no expense and no sacrifice that may be necessary to do this work properly and to set high standards from the start in the discharge of this responsibility.

As has already been said, the Federal Government has established the policy of subsidizing vocational education through the use of federal moneys. Prior to the passage of the Smith-Hughes Act, however, this subsidy was used largely for the purpose of technical education. This technical training will, of course, constitute a large part of the preparation of teachers, particularly in agriculture and home economics. Therefore it is reasonable to suppose that since the Smith-Hughes Act includes in its provisions the training of teachers in these same lines, the use of this money will be for the specific purpose of subsidizing only so much technical education as is necessary specifically to prepare persons for this particular purpose.

In other words, the Land-Grant Colleges of the country should not expect to use the federal moneys for teacher-training for the support of technical classes already carried on by the institution and supported, in part at least, by federal moneys, but they should be willing to use the federal moneys for such special courses and such special classes as may be necessary in order to discharge properly this new responsibility which the Smith-Hughes Act is presenting to them.

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It is from this point of view that with confidence I present for the approval of this body the rules and regulations adopted by the Federal Board for the expenditure of money for teacher-training in the institutions of the State.

For the maintenance of what classes may federal moneys for teacher-training be used?

Answer:

(a) Regardless of whether or not federal funds are to be used for all the classes or subjects in the course of study it is necessary for a State Board to submit the full course for approval by the Federal Board under Section 8 of the Act before federal money may be used for any of the classes.

(b) The fact that the full course of study has been approved does not mean that federal money may be used for the maintenance of instruction in all subjects of the approved course.

(c) The Board realizes that the students who are being prepared as teachers of vocational subjects will to a greater or less extent be taught in the usual and regular classes of the institution giving technical or pedagogical training to mixed groups of students pursuing the work with different aims. In general, the purpose of the teacher-training fund under the Smith-Hughes Act is not to cooperate with the States in the support of customary courses of instruction but to promote the establishment of courses and subjects having as a distinct aim the preparation of teachers of vocational subjects for service in schools and classes of the type organized under the Smith-Hughes Act. For these reasons federal moneys for teacher-training may not be used for the maintenance of mixed classes but only for separate classes.

(d) Federal funds for the training of teachers may be used only on the following conditions:

(1) That the classes for which these funds are used are composed entirely of those students who are preparing to teach in vocational schools. Such students must be pursuing the course of study approved by the State and Federal Boards.

(2) That no separate classes for which federal funds are used are to parallel other classes being conducted in the institution. When such separate classes are formed it must be clearly shown that they are a necessary addition to classes already in operation for other students. Instruction in these separate classes must be sufficiently differentiated from the regular classes to justify their establishment and maintenance.

FEDERAL BOARD FOR VOCATIONAL EDUCATION.

THE PRESIDENT. Mr. L. S. Hawkins, assistant director for agricultural education, Federal Board for Vocational Education, will now review "The Training of Vocational Teachers in Agriculture."

THE SMITH-HUGHES ACT
THE TRAINING OF VOCATIONAL TEACHERS IN AGRICULTURE

BY L. S. HAWKINS

If it were possible to emphasize more strongly than Doctor Prosser did one statement which he made, I would attempt to do that emphasizing.

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He said and I reiterate that so far as the success of the Smith-Hughes Act in agricultural education is concerned there are two things which, if properly done, would relieve everybody of anxiety concerning the success of the work. They are:

1. Proper supervision of agricultural education within a State.
2. The proper training of teachers within a State.

As I see the situation at the present time, the Land-Grant Colleges are primarily concerned with the second responsibility rather than with the first. Therefore, in those States where these colleges are to do the teacher-training they assume about half of the responsibility for the success of this great movement in secondary agricultural instruction.

There are, in general, two types of secondary schools of agriculture.

A. *The special or separate schools* which usually have extensive equipment in the way of buildings, farm lands, animals, machinery, etc. They are equipped to give boys practical experience in farming, to teach the art of agriculture as well as the science. As a matter of fact, the way in which they are conducted tends toward a maximum of instruction in the science and a minimum of instruction in the art. These schools usually have a fairly large corps of instructors who specialize in the various branches of agriculture, the degree of specialization depending largely upon the size of the school. The county schools of Wisconsin and Massachusetts and the state schools of New York and Minnesota are examples.

B. *The departments in high schools* which usually have a minimum amount of equipment and only one or two teachers of agriculture. Until recently these schools also have given more attention to instruction in the science of agriculture than they have to farming. With the growth and development of the home project idea, however, these schools are relating the class room instruction more closely to farming conditions and farm practice as well as extending the work of the school to the study and supervision of some practical farm work carried on by the pupils at their homes, the home project being a project in farming carried on at home by the pupil under the supervision of the teacher.

In the separate or special agricultural schools there is usually found three types of teachers: (a) instructors in farm work; (b) instructors in agricultural and related sciences such as agronomy, farm crops, animal husbandry, agricultural biology, agricultural chemistry, etc.; (c) instructors in academic subjects such as English, history and civics.

In the high school departments of agriculture there is usually only one instructor in agriculture who handles the instruction in farm work and also teaches agricultural and related sciences. In these departments academic work is usually done in the regular classes of the high school rather than in separate classes taught by special instructors.

In this discussion I have in mind in the main the preparation of the teacher of agriculture for the high school department of agriculture. My method will be to state what in my mind are some of the desirable qualities and abilities which a teacher of agriculture should possess, followed in each instance by a discussion of the training suited to produce or develop these desirable qualities and abilities.

1. A teacher of agriculture should be thoroughly conversant with farm

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life. This means that he should know how and be able to perform the ordinary everyday work of the farm and that he should also know the farm boy and farm folks. A teacher may have secured this contact and knowledge of farm life by being brought up on a farm until the age of 14 or 16, or he may have had extended experience working on a farm. Although there may be exceptions, few men have become thoroughly conversant with farm life unless they have spent at least a portion of their younger years on the farm. There is something about the coming into contact with farm life during the early and formulative period that gives an attitude or feeling toward life on the farm which is different from anything that can be acquired after reaching maturity. Furthermore, some of the farm tasks which a boy performs under compulsion gives him a training which he would not otherwise get, since he seldom has the patience or the grit to acquire this training after he reaches mature years. These tasks seem hard at the time, but I believe they bring out the fiber of the man and show in his later work.

Of course it is understood that a boy may have lived all his life on a farm and yet not have become familiar with certain farm operations, particularly those which have to do with the more modern developments in agriculture, so that merely being brought up on a farm does not necessarily make one thoroughly conversant with modern farm projects. It is quite necessary that a teacher of agriculture secure some experience working on a farm after reaching mature years, that is after having received a certain amount of his training in the modern science of agriculture.

In brief then, a combination which includes the experience of early years and the experience gained from combined instruction and practice in later years is probably the most desirable means of making one thoroughly conversant with farm life. It is practically impossible during the course of instruction in teacher-training to give sufficient farm experience to enable one successfully to teach agriculture and it is seldom that a year or two of work on a farm can give a real knowledge of farm life even though it may make a man proficient in farm work.

2. A teacher of agriculture should be not simply a specialist in one or two lines of agriculture, but should have a good, general knowledge of the entire field of modern, scientific farming. In order that the teacher may have a general knowledge of all the fields of agriculture and yet not spend his lifetime in going through an institution, it is desirable that in those departments of the institution dealing with special fields of agriculture, general courses be given which will in nature be a more or less elementary treatise of the whole range of that particular field.

Our agricultural institutions have shown a tendency to develop a high degree of specialization, so much so that in some institutions, if a student desires to secure instruction covering the general field of animal husbandry, it is necessary for him to take six or eight courses including feeds and feeding, breeds and breeding, diseases of animals, stock judging, and, perhaps, special courses in stock and dairy feeding. Not that I would for a moment advocate the dropping of these highly specialised and technical courses, but rather than in addition to them I would suggest a general course in animal husbandry.

I think of this general course in relation to the special courses somewhat as I think of taking a student up on a high mountain and pointing out to him the various highways which lead to certain points in the land-

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scape. The reason for taking him up there and pointing out these various highways is that he may know something of the lay of the land and intelligently choose which of these highways, if any, he wishes to travel. This procedure would be in contrast to that of placing him at a central point whence he could see only a few rods of each highway, and asking him in which direction he would prefer to go. In the latter instance, if he wished to get an idea of the landscape, he would have to travel some distance on each road and the chances are that when he got through traveling the roads he would not have a very definite idea of the relation of these roads to the makeup of the landscape.

These general courses for teachers are just as valuable for students preparing to enter other lines of work connected with agriculture. A student who is intending to specialize in poultry husbandry ought to be able to get some general courses in animal husbandry, dairying, fruit growing, agronomy, rural engineering, etc. Incidentally I think that the arrangement of such general courses would help to solve the problem which is continually confronting the colleges relative to the question whether or not entrance credit should be given to secondary courses in agriculture. Personally I am inclined to think that the colleges have made a wise move in accepting secondary school agriculture for entrance. Furthermore, I think that where students have had this general instruction in a secondary school and it has been based largely upon the practical work of the farm, it might be offered as a substitute for these general preliminary courses of the college. I hope, however, that the time will never come when the colleges give advanced credit, credit toward graduation, for any kind of agriculture work done in the high schools. I make a distinction here between offering work done in the high school as a basis for entering certain advanced courses in the college and offering them for college credit toward graduation.

In addition to possessing a good, general knowledge of all of the fields of agriculture the teacher of agriculture should be thoroughly conversant with and skilled in at least one of these lines. If his school is located in a dairying section, it is needless to say that his special strength should lie in the field of dairying, or if he is in a fruit growing section his long suit ought to be fruit growing.

3. A teacher of agriculture should be able to organize and impart his knowledge and at the same time direct the activities of his pupils. An extended knowledge of agriculture is of little use to a teacher unless he can both organize and impart what he knows. Moreover a man may know a lot and be able to tell all he knows and yet not be a successful teacher, for after all, successful teaching consists in directing the work of the pupils rather than in pouring out information to them. A teacher must be able so to direct the activities of the pupils that they may develop in turn a knowledge and ability which will enable them successfully to carry on farm work.

We are all familiar with the old statement that "teachers are born, not made." The only trouble with that statement is that it is wrong end to; teachers are made not born. Of course there is no disputing the fact that in making teachers some men are of better material than others. However, a course of instruction dealing with what has been and is being done in the schools and with the way in which it is being done is of almost invaluable aid to the prospective teacher whose knowledge of the school

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business up to the time of taking this course was gained largely through laying his plans as to just how he would outwit the teacher under whom he sat.

This knowledge of what is done in school and how it is being done comes from a study of such professional subjects as school administration, general methods of teaching, and from actual observation of teaching done by those who are themselves trained teachers. Besides these general methods of instruction there should also be instruction in special methods of teaching agriculture as differentiated from methods in other lines. Such special classes should emphasize: (a) Seasonal sequence of topics rather than text sequence; (b) combination of library and recitation work rather than a separation of these two lines; (c) methods of instruction through projects, observation and practice teaching in the kind of schools in which he is to teach, the apprenticeship system of practice teaching. It should be noted here that the institutions or parts of institutions having to do with the training of teachers have developed as great a tendency to specialization in education as the institutions giving instruction in agriculture have developed a high degree of specialization in agriculture. Many of the teacher-training courses and institutions are made up of highly specialized courses intended to prepare research workers in the various fields rather than to prepare teachers. For instance, take the subject of psychology. Some institutions give a half dozen courses in psychology without offering any general, fundamental course which points particularly toward the field of teaching. This is also true in regard to school administration, history of education, etc.

4. The teacher of agriculture should understand the intent of vocational agriculture. This means that: (a) he should be familiar with economic conditions, particularly in so far as they affect farm life; (b) he should know of the social changes that have taken place in country life; (c) he should be familiar with other agencies which deal with agricultural problems, that is, the farm bureau, the Grange, and other farm organizations. This implies a study of related rural subjects such as rural economics, rural organization, rural sociology, rural institutions, etc. He should also be familiar with the problem of connecting up the school and home work of his pupils. The modern terminology which is used for this connecting up of school and home activities, in so far as it relates to agricultural instruction, is the home project. This most important development in high school agricultural instruction is deserving of more study and also of more attention in institutions which are intending to prepare teachers of agriculture. As a matter of fact, this is the particular phase of the work which, in a large measure, distinguishes the department of agriculture in the high school from the special or separate school of agriculture.

5. The teacher of agriculture should have a knowledge of wood-working and blacksmithing and mechanical drawing; not that he should be a cabinet maker or a blacksmith or a draftsman, but rather a jack of all trades, knowing how to tie knots, splice ropes, mend harnesses, upset a rivet, sharpen tools, and do rough construction work like building chicken-coops, hen-houses, saw-horses, etc.; a course in farm mechanics which consists of some mechanical drawing, wood-working, and some iron-work. A special class would have to be constituted in practically every institution to prepare the man. No composite of college courses in mechanical draw-

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ing where a year is spent in making letters and figures, or of engineering courses or machine-shop courses is needed, but a general repair and rough construction course.

6. The teacher of agriculture should have a general education equivalent to that obtained in a four-year high school course and, in addition, a knowledge of current history and social and economic conditions, with particular reference to their bearing on country life problems. He should be able to express himself clearly and concisely, both orally and in writing.

I have attempted in the following table to indicate by type subjects the general scope of a course for teachers of agriculture. I hold no brief for the classification here used. It may be that plant pathology should be located in the column headed "agricultural" rather than in the column headed "sciences."

APPROXIMATION OF TIME IN A COURSE FOR TEACHERS

(Practical experience not included)*

Agricultural		Sciences		Humanistic		Professional	
4-year course 40%	2-year course 60%	4-year course 30%	2-year course 15%	4-year course 20%	2-year course 15%	4-year course 10%	2-year course 10%
Field and forage crops		Chemistry		English		Education	
Soils and fertilizers		Physics		History and government		psychology	
Animal husbandry and dairying		Geology, etc.		Rural economics		Principles and general methods	
Poultry husbandry		Biology		Rural sociology		School organization and management, etc.	
Horticulture		Agricultural chemistry		Rural organization, etc.		Vocational education history and principles	
Vegetable gardening		Economic entomology				Special methods (In Agriculture)	
Farm mechanics		Plant pathology				Practice teaching, etc.	
Farm management, etc.		Plant breeding					
Both general and special courses in the above		Veterinary science					
		Bacteriology, etc.					

*See Proceedings 28, pp 40-61, [Rpt. Com. Instr. Agr.] (1914).

The above time-statement is an approximation only; and, of course, the percentages given will vary with the institution and the agricultural interests of the State in which the institution is located. The reason for largely increasing the percentage of time given to the agricultural subjects in a two-year course as compared with the four-year course is that the instruction in the agricultural subjects is essential in the preparation of a teacher of agriculture. Practically all of the subjects included in the group labeled "agricultural," "sciences," and "humanistic" already appear in the curricula of most agricultural colleges. It is assumed that students who are preparing to become teachers will study these subjects in classes with other students in the institution. In those institutions which maintain courses in education for students other than those who are to become teachers of vocational agriculture, the same thing will be true of classes in educational psychology, principles and general methods and school organization and management. In an institution of the latter class only classes in vocational education, special methods in teaching agriculture, and practice teaching, would be set up separately and especially for teachers of vocational agriculture. In other words, although a course of study is laid out covering the two or four years in an institution, very

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few of the subjects included in that course would be given in separate classes especially for vocational teachers of agriculture.

I am just trying to get before you my idea of what ought to be the general content of a two- or four-year course for teachers of agriculture. In so far as the operation of the Smith-Hughes Act is concerned, it will probably influence the work in the column headed "professional" rather than that in the other three columns. For those institutions which have no department of education it would appear that if they are to operate under the Smith-Hughes Act they might very well set up all of the professional courses, with the idea that they are to prepare vocational teachers and vocational teachers only. On the other hand, those institutions which are preparing general teachers might well use the federal money, and the money which is to offset the federal money, on these special courses in vocational education, including principles and methods of teaching agriculture and practice teaching.

Finally, let me say that I cannot too strongly emphasize the need in every institution which is to prepare teachers of vocational agriculture of supervised practice in teaching. This means to the professional preparation of the teacher just what laboratory work means to the agricultural work of the institution. We all know, and have recognized for years, that book farming does not amount to much as such, but that practical laboratory work is necessary really to teach modern methods of agriculture. Book instruction in methods of teaching will, and ought, to receive the same criticism when it is divorced from the actual laboratory practice in teaching that book farming deserved and received when it was divorced from the actual practice of farming and from the practical laboratory work which we all believe should accompany theoretical or book instruction. If I have any warning to utter to those who are to take up or who have taken up the preparation of teachers of vocational agriculture, it is that they do not try to prepare teachers in agriculture by the lecture and recitation method alone, but supplement it by a laboratory course of instruction in which there will be supervised practice teaching. Make this practice teaching practical, that is, have the practice teaching done in schools or classes of the kind with which the student teachers are to deal when they complete their work at the institution. Make the laboratory work of these teachers in preparation conform as nearly as possible to the actual teaching conditions which exist in the State.

In conclusion, I wish to say that if you are to have any influence on this movement of vocational agriculture of less than college grade, the greatest influence will be through the kind of teachers which you prepare and send out. The agricultural colleges will be judged not alone by the work which is done at the college along agricultural lines but also by the work done in the secondary schools by the men whom they prepared. For myself, I feel confident that the colleges of agriculture in this instance as they have in other fields of work which they have undertaken, to use the vernacular, will deliver the goods.

THE PRESIDENT. Mr. Lewis H. Carris, assistant director for industrial education, Federal Board for Vocational Education, will now discuss "The Training of Vocational Teachers in Trades and Industries."

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The Smith-Hughes Act

The Training of Vocational Teachers in Trades and Industries

By L. H. Carris

Through the enactment of the Smith-Hughes Act there has been thrust upon the State Boards for Vocational Education in each of the States accepting its provisions the comparatively new problem of training teachers for service in the vocational schools or departments of trade and industrial education which have been established or may be established in accordance with the standards of the federal law. Very few of the States have had a program for vocational education in trade and industry; even a less number have attacked the specific problem of training teachers for service in vocational schools.

This is especially true in the field of trade and industrial education. Many of the States have been training teachers of agriculture in schools of secondary grade, and departments of education have been established in many of the agricultural and mechanical colleges. Many of the States also have colleges or departments of colleges which give instruction in home economics and in this field there have been many institutions which have trained teachers for service in the field of home economics in our high schools.

Very few of the higher institutions of the country, however, have formulated plans for the training of teachers for service in trade or industrial schools of secondary grade. There have been a number of normal schools, private schools and colleges which have been preparing teachers for service in the manual arts departments of elementary and high schools, but this preparation does not meet the necessities in the case of schools and departments operating under the Smith-Hughes Act nearly as well as does the preparation received by teachers for service in the fields of agriculture and home economics. The problem is further complicated because of the number of trades and industries which may be taught in the schools and for which teachers must be prepared.

The consideration of the problem, however, cannot be postponed. Each of the States accepting one or more of the benefits of the Federal Act, not later than 1920 must begin its program of training teachers in each of the three fields—agriculture, home economics, and trade and industrial education. Most of the States which have submitted plans to the Federal Board for Vocational Education for approval have provided for the immediate organization of teacher-training work. There is available in each of the States accepting the act a considerable sum of money for the maintenance of teacher-training, and the law provides that not less than 20 percent and not more than 60 percent shall be spent for the training of teachers in any one of these three fields. Since every dollar of federal money which is used for this purpose must be matched by a dollar of state or local money, it is evident that a large sum is available at the very beginning of this new work—a condition which has rarely prevailed hitherto in any form of work which to a large measure must be inaugurated without extensive experimentation.

The small States of the Union are alloted at least $5,000 for training teachers. If the State Board of Education of a small State should decide to spend only the minimum amount possible—20 percent—this State would

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have $1,000 of federal money to be matched by $1,000 of state or local money, and would have, in all, not less than $2,000 to be expended for the training of teachers for service in trade and industrial schools. Should the Board of Education of a small State decide to spend 60 percent, the maximum amount possible, for this work, this State would have available $6,000 for this work. From these sums the amounts vary until we have the possibility of an expenditure of approximately $170,000 in the most populous State for this new work.

The State Boards for Vocational Education, therefore, are attempting to answer several very difficult questions: (1) What institution or institutions will be selected to do this work? (2) Where can teachers be secured who understand what instruction should be given? (3) How many teachers should be trained for the various trades? (4) Should the work be intra- or inframural in character? (5) What should be the length of the course or courses? (6) What plan shall be adopted for the promotion of trade and industrial education?

KINDS OF SCHOOLS IN WHICH THE TEACHERS TRAINED ARE TO SERVE

The character of the work to be done determines to a large measure the kind of professional training which should be given to teachers. Therefore, before an institution can set up courses of study, select teachers for the work, enroll students, and organize classes, it must have a definite knowledge of the kinds of schools and classes in which the teachers trained are to serve and a knowledge of the work which is to be carried on in those schools and classes.

The Smith-Hughes Act provides for the organization of all-day schools or classes, part-time schools or classes, and evening schools or classes in trade and industrial education. A brief description of each of these types will furnish in a measure the reasons upon which these conclusions are based as to the kind of professional work which can be undertaken by an institution in preparing teachers for service in these schools.

1. *The all-day school.* The all-day school must be of less than college grade. The controlling purpose must be to fit for useful employment and must be designed to meet the needs of persons over 14 years of age who are preparing for a trade or industrial pursuit. These schools or classes may be organized as separate classes or as departments in existing schools.

The Federal Board has ruled that the all-day school or department in cities having a population of over 25,000 must be so organized that they shall prepare for particular trades or industrial pursuits, and that they shall be so arranged that a particular group of persons may prepare for a particular trade or occupation. It is not the intent of the Smith-Hughes Act to allow a sampling of many trades and pursuits, as is now the practice in many of our technical and industrial high schools.

The term "unit trade class" has come to be used in the consideration of the ways and means by which these schools and classes can be organized. The Federal Act provides that in cities of under 25,000 a modification may be made as to length of course and hours of instruction per week for schools and classes giving instruction to those who have not entered upon employment in order to meet the particular needs of such cities and towns. In this case, the Federal Board has ruled that the unit trade class organization need not be maintained, that the instruction may be of a more general character, and that the school may have as its aim the preparation

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of its pupils for profitable entrance upon any one of several prominent industries of the community served.

A typical trade or industrial school in one of the larger cities might have classes in such trades as printing, machine-shop work, pattern-making, plumbing, electrical trades and mechanical drafting. The instruction in this case, however, would be centered about each of these trades and the group of pupils would spend a considerable portion of their time in actual work in shops having an equipment approximating that used in commercial shops.

In a smaller city a less amount of equipment for each of the industries would be necessary and a less amount of time in productive work in each of the trades would be required. In the case of either kind of all-day school, however, the pupils must give at least half of their time to work on a useful and productive basis while the remaining half of their time may be given to related work and to such subjects as make out a well-rounded course, and which also include instruction in subjects directly relating to the trade.

A typical course of study for a two-years' course in an all-day school giving instruction in machine-shop practice follows:

FIRST YEAR

Machine-shop practice	15	hours	per	week
Mathematics, related to machine-shop practice	3	"	"	"
Science, related to machine-shop practice	2	"	"	"
Drawing, related to machine-shop practice	5	"	"	"
English, related to machine-shop practice	3	"	"	"
Civics, related to machine-shop practice	2	"	"	"
Total	30	"	"	"

SECOND YEAR

Machine-shop practice	15	hours	per	week
Mathematics, related to machine-shop practice	3	"	"	"
Science, related to machine-shop practice	2	"	"	"
Drawing, related to machine-shop practice	5	"	"	"
English, related to machine-shop practice	2	"	"	"
Industrial history	3	"	"	"
Total	30	"	"	"

The methods of instruction followed in the all-day school or department should conform to the best commercial shop practices and should not be a series of isolated exercises which have been developed for the purpose of teaching processes step by step.

Three kinds of teachers may be employed in the all-day school: (a) The teacher of the shop work; (b) the teacher of the related subjects; (c) the teacher of non-vocational subjects. Since the expense for instruction in non-vocational subjects must be borne by the State or local communities, it is fair to conclude that no portion of the funds allowed to any State for the preparation of teachers of trade and industrial subjects for service in all-day schools or departments can be utilized for the professional training of teachers of these non-vocational subjects. The problem in the work of teacher-training then is the preparation of shop teachers and of related subjects teachers.

2. Part-time schools or classes. At least one-third of the fund allotted to any State for trade and industrial education must, if expended, be applied to part-time schools or classes for workers over 15 years of age who have entered upon employment. The phrase "such subjects" in a part-

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time school or class may mean any subject given to enlarge the civic or vocational intelligence of the pupils. Such classes must be in session at least 144 hours per year.

The varieties of part-time schools and classes are many. This becomes very clear when we take into consideration that there may be variations as to the number of hours given to instruction and variations as to the kind of instruction which is given. The variations as to the subject-matter taught in the part-time classes are also numerous. In general, it may be said that there are two kinds of instruction possible—that which supplements the employment in which the youthful worker is daily engaged and which is sometimes called trade extension work; and that which extends the education of the boy or girl which was interrupted upon his entrance into industry. This instruction is usually called general continuation school work.

The Federal Board has adopted as a part of its statement of policies this statement: "In general federal monies may be used to pay the salaries of teachers employed in those part-time schools or classes where wage-working boys or girls receive any or all of the following benefits:

(a) Increased skill or knowledge in the occupation which the wage-worker is following.

(b) Skill or knowledge leading to promotion in the industry or calling wherein the wageworker is engaged.

(c) Improvement in the knowledge of regular subjects which the wageworker did not complete in school.

(d) Increased civic or vocational intelligence.

(e) Skill and knowledge in home economics for girls employed as wageworkers.

It is evident that there are in the part-time schools and classes three types of teachers for which professional work may be given:

(a) Shop teacher.

(b) Related subject teacher.

(c) General continuation subjects teacher."

3. *Evening schools or classes.* Instruction in evening schools or classes must be supplementary to the day employment. The membership in the evening classes is therefore limited to those persons who are engaged in trade or industrial pursuits and can profit from attendance at the school. There is no provision made for subjects which are non-vocational as a part of the work. The work which is supplementary to the day employment may be instruction in the particular shop processes in a school shop supplied with proper equipment. In this case the trade or industrial worker may secure advancement in his work through the mastery of additional parts of the trade or through a knowledge of different machines used in the trade. The instruction may also be related to the work of the day employment. For example, a class composed of men engaged in machine-shop work in the day might pursue with profit in evening classes instruction in the reading of blueprints used in the machine-shop trade and instruction in such freehand sketching or elementary mechanical drawing as would prove an asset to a man employed in the machine-shop trade.

The Smith-Hughes Act does not specify the length or the number of sessions in which an evening school may be maintained. It is conceivable that a class giving supplementary instruction might be organized for a

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small number of evenings, or it may be possible for the class to give instruction extending over a large number of evenings and perhaps over more than one year. However, the limited number of hours available in any evening school course makes it impossible to teach the beginnings of a trade, and it was probably for this reason that Congress decided that federal moneys should be expended in the promotion and development of trade extension evening classes rather than trade preparatory evening classes.

There are two types of teachers who may be employed in evening school classes,—the shop teachers and the related subject teachers.

QUALIFICATIONS AND TRAINING FOR TEACHERS IN VOCATIONAL SCHOOLS OR CLASSES

The next step in providing professional work for prospective teachers in trade and industrial schools, after considering the kind of schools in which they are to serve, is to consider the qualifications and training demanded of these teachers in so far as general education and trade experience are concerned.

From the foregoing description it will be seen that the following types of teachers can receive instruction in schools or classes maintained in part from federal funds allotted to the States for this purpose:

1. Teachers of shop subjects in the all-day, part-time, or evening school classes where instruction is limited to a particular trade.
2. Teachers of shop subjects in general industrial schools and in part-time schools when the shopwork is of a general or elementary character.
3. The related subjects teachers in the all-day, part-time, or evening classes.
4. Teachers of non-vocational subjects in part-time schools or classes.

1. *Training of shop teachers for unit trades.* For the first kind of teachers mentioned above, teachers of shop subjects in all-day, part-time and evening schools or classes where the instruction is limited to a particular trade, it is absolutely necessary that the prospective teacher should have had an adequate trade experience in the particular trade which he proposes to teach. It is fundamental to the success of any trade or industrial class that the instructor who has charge of the work conducted on a useful or productive basis should himself have had an opportunity of mastering this trade.

In the emergency which has existed in the organization of trade schools or classes it has been necessary to select teachers who have secured their shop experience as actual workers at the trade. It is also probable that for a long time to come shop teachers must be selected in the same way. This is but another way of saying that there exist at the present time very few schools, if any, which give a training for a particular trade, which give a sufficient mastery of that trade to warrant its graduates in being selected as teachers of that trade without further experience.

State Boards of Education are required to submit as a part of the plan for any State the qualifications of teachers. In stating the qualifications of shop teachers practically every State has given as the minimum of shop experience required at least two years of service beyond the apprenticeship stage. In order that the teachers with the necessary trade experience may be secured, many of the States have had to modify the

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usual certificating rules. There does not exist an adequate supply of possible teachers with the requisite trade experience who have had in addition to this a general education extending much beyond the elementary school stage, and if high school graduation were made a requirement for the shop teacher the supply would be very limited.

It is granted that the more general education any teacher can have, the better teacher he is, provided that in addition to this general education, he has had an opportunity to secure an experience in the trade he proposes to teach under actual shop conditions. It may be concluded, therefore, that the group of prospective shop teachers must be recruited very largely from those who have not had any extended general education. It must be remembered that the chief duty of such an instructor is to impart to others skill and knowledge of the processes of the trade. Hence his trade experience and success must always be the principal criterion in his selection.

2. *Teachers of shop subjects in general industrial schools and in part-time schools when the shopwork is of a general or elementary character.* In this case there do exist schools which give to a considerable degree the training in shop subjects required as a part of the assets of such teachers. The graduate of an engineering school who has had opportunity to take work in various shops during his college work has the qualifications demanded for this work. He would be a better teacher if his college work were supplemented by some practical experience but should be required to secure it as a part of his preparation. There exist also certain schools for the preparation of manual arts teachers which give to a large measure the shop training required. It can be concluded, therefore, that in the case of this kind of teachers a considerable part of the work may be done in residence at the institution selected by the State Board to conduct the teacher-training work.

3. *The related subjects teachers in the all-day, part-time, or evening classes.* The related subjects teacher is to give that part of the trade and industrial education which is an inherent part of the vocation taught. The subject-matter is, however, of such nature that it may be taught in the ordinary class room or science laboratory. This is the drafting which goes with the trade, the mathematics which the master of a trade should know, the science which can be taught to the prospective trade worker. For this type of teacher a higher degree of scholastic preparation can be required. These teachers can be recruited from graduates of secondary technical schools who have had in addition to this school training supplementary commercial experience; from graduates of engineering schools of collegiate grade or from persons who have had a partial course in such institutions or from among the graduates of institutions which prepare teachers of manual arts subjects. This latter class of teachers usually have been prepared for service in manual arts departments. Their shop experience, the general education required for admission to such schools, and their training in related subjects in these schools, give them the necessary qualifications.

4. *Teachers of non-vocational subjects in part-time schools or classes.* The preparation of such teachers is of about the same character as that demanded for the preparation of teachers for the higher grades of the elementary schools or for the teachers of high school subjects. If instruction is provided for this particular type of teachers, it should be in

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addition to the usual normal school or collegiate course, and should deal largely with the particular problems encountered by the teacher of a part-time school or class. When States adopt a compulsory continuation school program there will be a large opportunity for the special training of such teachers.

KINDS OF INSTRUCTION IN THE TRAINING OF TEACHERS OF TRADE AND INDUSTRIAL EDUCATION WHICH MAY RECEIVE SUPPORT FROM FEDERAL FUNDS

The Federal Act provides a large sum of money to be used for the training of teachers of agriculture, home economics and trade and industrial subjects. The Act appropriates also large sums for the payment in part of the salaries of the teachers of these subjects in schools or departments. It is fair to assume, therefore, that Congress intended that the fund for the training of teachers should be used exclusively for the purpose of training teachers for service in schools which reach the standards set for classes giving instruction in agriculture, home economics, or in trades and industries. This leads to only one conclusion, and that is that in order to receive federal aid the instruction must be given to segregated classes. The Federal Board has ruled to this effect. It has also ruled that these classes must not parallel in the subject-matter of instruction other classes in the institution giving the training.

This interpretation of the Act makes the organization of professional work in preparation for teachers of trade and industrial subjects rather complicated. It is impractical for the schools or colleges to give the practical trade experience required in the case of shop teachers. This makes it certain that very little, if any, of the work in training of shop teachers can be done in residence. The problem is not so difficult in the case of related subjects teachers, since the institutions do exist which are giving the necessary technical training.

THE WORK OF THE INSTITUTION SELECTED TO GIVE TEACHER-TRAINING FOR TRADES AND INDUSTRIES

This paper cannot go into the discussion of the relative merits of the various institutions which may be selected by State Boards of Education to conduct the professional work. This selection must be made by the State Boards themselves. Assuming that the State Board has made its selection, we can outline briefly the professional work which can be given in this institution. The following considerations should be kept in mind in determining the work to be undertaken.

1. The specific purpose of the teacher-training scheme in any State is to improve instruction in its vocational schools. The federal money for the training of teachers is available only for this one specific purpose and not for the training of elementary school teachers, manual training teachers, or general high school teachers.

2. The law of supply and demand becomes the key for the number of workmen who should enroll in teacher-training classes. The training of a great surplus of trade workers for teaching positions would result in economic waste and would really hinder the development of vocational education.

3. There are four steps necessary in any complete teacher-training scheme.

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(a) The recruiting of the group to be trained, whether from among those in residence at the institution, or from those with adequate trade experience who can be recruited for residence work in the institution or for work in evening or short courses.

(b) The training of the group when recruited.

(c) The placement of those who have finished required courses of training.

(d) The training of teachers who have already entered service.

The Federal Board has ruled that any of these activities may properly receive support from federal funds. The institution which has the responsibility for the training of shop teachers needs to give particular attention to the selection of candidates for this training. Experience goes to show that the successful teacher in the vocational school or department must be a person of considerable maturity before beginning his teaching. This is inherent in the character of the school itself, which in this respect differs from elementary or high schools where conditions are fixed and courses of study are prescribed, and attendance of pupils is required by law. In vocational schools the teacher must share very largely in the making of the course of study, in the determining of the content of courses, in the meeting of needs of individual pupils of varying types of ability and interest, and often in the establishment of a workable contact between individuals and the school and between the school itself and industry.

In the selection of candidates for training as shop teachers the institution responsible for the recruiting of the class should require evidence from candidates of a general education sufficient to enable the candidate to become a successful teacher of his vocation. For practically all shop teachers the minimum requirements would include ability to read, write and converse intelligently concerning his trade, and also a knowledge of the fundamental mathematics of the trade. The actual amount of general education required will necessarily vary among the various trades.

The institution should be sure that a candidate for admission to the teacher-training class has had an adequate trade experience, or will have had an adequate trade experience upon the completion of the teacher-training course. It is clear that the recruiting of the group is a very important matter. In the case of shop teachers the institution which is to recruit the class cannot use the ordinary advertising plans such as statements in catalogues or regular bulletins. Some one charged with the responsibility should be required to attend meetings of any organizations of workmen. He should be required to visit superintendents and foremen in the trades for which it is proposed to recruit teachers. He should require special literature to circulate among workmen. He should be given plenty of time for personal interviews and for registration for the work. It cannot be emphasized too much that this preliminary work carried on conscientiously will contribute very much to the success of the entire plan.

The institution selected to give the work must carry its instruction to the place where its pupils are employed. It will rarely be feasible to recruit a class of trade workers who will give up their daily employment and enroll in and attend a class given at any considerable distance from their homes. The desirable teachers receiving a master's wage at their employment are many times men of families and have civic, fraternal and religious affiliations. Probably the most successful work can be given in

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evening classes and through the extension department of the institution which is to give the work.

DURATION OF THE PERIOD OF TRAINING

For persons of adequate trade experience who desire to become vocational teachers and who are to be trained under the provisions of the Smith-Hughes Act, at least 120 hours of instruction should be provided. Assuming that a minimum of 120 hours is determined upon as the length of the course for mechanics in training as teachers of unit trade courses, the following work may be given to advantage:

Of this time approximately one-fourth should be given to pedagogy and mechanics for teaching, including the theory of vocational education; the organization of vocational schools under the Smith-Hughes Act and the state school laws; general methods of teaching in vocational schools; special methods for teaching the trades under consideration in the course, with emphasis on the analysis of a trade for instruction purposes made by a master of the trade proficient in teaching; the formulation of courses of study for shop and related work; shop and class discipline; records both of student efficiency and the efficiency and quality of materials and tools, with special reference to tool room and stock room as methods of indirect discipline and instruction.

Approximately one-fourth of the time should be devoted to such of the following subjects as are necessary for success in the trades under consideration: art in industry, shop mathematics, mechanical drawing and design, study of materials, business methods, factory methods, such as routing work, time cards, job tickets, shop tickets, etc.

Approximately one-fourth of the time, and more wherever possible, should be devoted to actual practice teaching under trade conditions carefully supervised after lesson plans or project plans have been made out and approved.

Approximately one-fourth should be devoted to observation work and supplementary work in the shop to round out any part of the trade which the mechanic has failed to master during his own experience. Selection of candidates should insure: (1) that no extreme trade deficiency occurs; (2) that an arrangement can be made to supply reasonable deficiency in trade experience by using properly equipped shops in schools or plans for such instruction as part of the course or by recruiting the prospective teacher to get this knowledge in some existing school or plant in addition to the teacher-training course. In the latter case the one-fourth time saved may be prorated to other subjects or given to English, especially oral composition and organization of subject-matter for oral teaching.

THE TRAINING OF SHOP TEACHERS FOR GENERAL INDUSTRIAL SCHOOLS AND SHOP TEACHERS IN PART-TIME SCHOOLS WHERE THE WORK IS OF AN ELEMENTARY NATURE

In this case the professional work may be given to students who are in residence at an institution such as an engineering school, or as a school which gives special attention to the preparation of teachers for general industrial work. Here the situation is somewhat analogous to that in an agricultural college. The assumption is that there is a considerable body of students who are in attendance at the institutions for the purpose of

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taking a general engineering course or a general industrial arts course, and that among these students there may be recruited a group of sufficient size who are desirous of becoming shop teachers of general industrial schools or of the part-time schools as described above. In the event of such a group being recruited it would be possible to accomplish two things in their training:

1. Such study program arrangement as will permit the student who is desirous of becoming eligible for such a position to take as a part of his undergraduate work a more complete round of shop experience and to spend his vacation in commercial shops. Probably little of this work could be done in classes which would meet the conditions given by the Federal Board. That is to say, it is difficult to see how the adequate trade contact necessary could be given to segregated groups, although as far as the law is concerned there is no reason why such instruction should not be subsidized from federal funds.

2. The organization of classes for students who have expressed their intention of preparing for this work. In this case the work would be professional in character and might include courses such as the following:

(a) Theory and administration of vocational education. This course would be designed to give the students an insight into some of the larger problems of vocational education, and might include lectures, readings, discussions, visits to industrial plants and vocational schools. Some of the topics included in such a course might be, "A brief history of the development of vocational schools in the United States"; "Industrial education and apprenticeship"; "Industrial education as related to manual training"; "The relation of vocational education to general education"; "Types of vocational schools"; "The administration and organization of vocational schools"; "The purposes of the continuation school"; "State and national legislation for vocational education"; "The purposes and methods of occupational studies for vocational education"; "The social and industrial significance of vocational education."

(b) Industrial history and elementary economics. The purpose of this course is to orient the worker in the evolution of industry and in the modern economic and social problems resulting from present industrial organization. Some of the units of subject-matter in this course would include: the various stages in the evolution of industry with particular attention to the industrial evolution and the modern factory system; the rise, fall and decline of the apprenticeship system; the gradual growth of the conception that the individual is the ward only of the State, and that the State is directly obligated to provide education for all types of workers; the economic and social problems which result from modern industry; state and federal laws designed to safeguard workmen and society; the rise and development of state and federal legislation for education.

3. Methods of teaching in industrial schools. This course would deal with such subjects as the following:

How a pupil learns most easily and completely.

What is meant by a lesson.

Types of lessons.

How to adapt various types of lessons to shop and classroom teaching in the industrial school.

How to prepare lesson plans for various types of shop- and classroom work.

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The place of trade practice and theory in industrial school instruction from the standpoint of effective teaching.

How to organize shopwork in accordance with good teaching practice.

The project, the exercise and the factory method of handling shopwork. The advantages and disadvantages of each method from the standpoint of good teaching.

How to analyze the content of certain trades.

The place of drill and repetition in shop- and classroom.

Characteristics of industrial school boys.

Class management.

School and shop records.

4. Practice teaching. This course should provide an opportunity for the prospective teacher to teach under the supervision of a helpful critic. It should provide that the practice teaching should be done whenever possible in a school of the type for which the student is preparing to become a teacher. It may be necessary in some cases to provide for the practice teaching at some distance from the institution selected to do the work.

A prerequisite for entrance to the institution which may give this work is usually graduation from an approved four-year high school. It is to be hoped, however, that the institutions which are preparing shop teachers for general industrial or part-time schools may admit as special students persons of maturity who have had a considerable variety of trade experience.

TEACHERS OF RELATED SUBJECTS

The professional work given in preparation for teachers of related subjects differs but little from the work just outlined as desirable for teachers of shop subjects in general industrial or part-time schools. In courses 1, 2 and 4, as outlined above, students could be located in mixed classes as far as the work is concerned, in preparing them for either type of instruction. There could be organized an additional course which would be planned specifically for teachers of related subjects. This course may include the analysis of the various trades which the student may be called upon to teach as far as related subjects are concerned as well as the organization of the subject-matter which can be given as related science, related drawing, or related mathematics, etc., for any one of several trades.

TRAINING OF TEACHERS FOR GENERAL CONTINUATION SCHOOL WORK

As has been indicated previously in this paper, most of the preparation of teachers of non-vocational subjects in continuation schools will be carried on in the regular normal schools and colleges. Wherever a State is organizing an extensive system of part-time schools, the teachers of the regular public schools who are ambitious for promotion to part-time work, which usually carries a better salary, can be organized into extension classes to take work in special preparation for the peculiar problem of organization and management of a part-time class. It might also be possible to organize a separate group in a normal school or a college

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preparing teachers for service in the general education field, with the specific aim of giving a special preparation for part-time work.

TRAINING OF TEACHERS ALREADY IN SERVICE

As the work is so new in most of the States, for some time to come it will be necessary for teachers to begin service in vocational schools without an adequate professional preparation. The institution selected to give teacher-training work should also make provisions for the improvement of teachers already in service. This could be done: (a) through Saturday or evening classes, or short courses given in summer classes; (b) through individual instruction by means of an itinerant teacher who could visit the teachers while at work; (c) through institutes from one day to a week in length, where the teachers of a given State or a district within state borders could be called together for special instruction.

RELATIONSHIP TO CERTIFICATION

In order to make the teacher-training scheme effective, it will be necessary to have the very closest coordination of this work with any scheme of certification which legalizes the employment of teachers in federal-aided vocational schools. In all probability, the teacher-training scheme as provided for by the Smith-Hughes Act will in time absorb that part of a certification scheme in a State which hitherto has certificated vocational teachers as well as the regular teachers. The matter of certification can be best summed up by stating the Federal Board's answer to the question, "What is the policy of the Board toward the question of the certification of teachers in the State?" as given on page 33 of its Bulletin No. 1, entitled "Statement of Policies":

"The practices of the several States in certificating teachers necessarily affects the standards and policies of the State in certificating teachers of vocational subjects.

"The State Board may use federal moneys for teachers of vocational subjects if they meet the qualifications agreed upon by the two boards even though such teachers may not have been certificated to teach under the state laws. In most States, however, teachers must hold certificates before they can legally be paid for their services by the State or community. The Federal Board views certification from the standpoint only of a device which may assist or may handicap the State Board in securing and holding competent instructors.

"The situation as to certification varies widely among the States. In States where the legislature has prescribed in detail the subjects in which teachers must be examined for every kind and grade of license and has left practically no power in the hands of the state educational authorities to issue special licenses for teachers giving instruction in vocational education, the Federal Board will make such adjustments as it deems necessary. Should it be of the opinion that the system of certification used interferes with the proper selection and employment of teachers receiving federal moneys, it will give notice that at the next session of the State Legislature remedial legislation should be introduced.

"Where the chief school officer of the State of a certificating board is empowered to issue special certificates, this authority should be used so as to establish flexibility in employing and certificating vocational teachers.

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"Since the state laws governing the examining and licensing of teachers were in most instances framed before the rise of vocational education, few of them are adapted properly to meet the task of selecting and testing teachers for this new field. New standards and requirements are demanded. Experience along practical lines must be measured. Mechanical skill and the ability to use technical knowledge in a practical way must be tested. For many positions special skill and technical knowledge rather than general ability must be sought. In many cases practical tests should be given in place of, or supplementary to, written examinations. Evidence of successful experience in a vocation, as well as in teaching, should have large weight. The help of the layman, particularly of the practical man, should be used in determining the standards and tests by which the worth of the applicant for the teaching of any given occupation or trade is to be determined. This is equally true whether it be a question of trades and industries or agriculture or of home economics.

"Whether the present state provisions for certification admit of no flexibility, or whether the State Superintendent has power to deal temporarily with the difficulty by issuing special licenses, the Federal Board is of the opinion that the next session of the legislature in every State should commit the whole matter of examining and certificating teachers of vocational subjects into the hands of the State Board for Vocational Education, giving it power to establish from time to time such standards, tests, rules and regulations governing certificates as that board may deem advisable."

THE PRESIDENT. Miss Josephine T. Berry, assistant director for home economics education, Federal Board of Vocational Education, will now discuss "The Training of Vocational Teachers in Home Economics."

THE SMITH-HUGHES ACT

THE TRAINING OF VOCATIONAL TEACHERS IN HOME ECONOMICS

BY MISS JOSEPHINE T. BERRY

Home-making and home economics education have achieved a new status. That status has been recognized by the National Government in its most solemn fashion—in the language of a Federal law. In the Smith-Hughes Act home economics education is designated as a form of vocational education to be promoted by grants of federal aid, and by implication home-making is recognized as a vocation of fundamental importance to the national welfare alongside agriculture, trades and industries. Besides grants of aid for instruction in home economics subjects, the law appropriates money for the preparation of teachers of these subjects as a part of the program proposed for the promotion of vocational education.

Heretofore we have regarded home economics education as a part of general education. We have believed, on the whole, in instruction in home economics subjects as a good thing for all women. Therefore, we have been introducing home economics, domestic science, or household arts into the high schools throughout the country. But we have not required it of all young women students, and we have set up few courses of study in home-training designed to meet the needs of any special group of stu-

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dents. We have offered the courses in home economics subjects to be taken in large parcels or small parcels under almost any sort of elective system or conditions, in almost any order, and without any definite relation to other high school subjects.

But my subject is teacher-training and I seem to be already discussing schools. However, we are not, after all, so far afield. Before we can determine what needs to be done to provide adequate teacher-training for teachers of home economics subjects in vocational schools, it will be necessary to consider the implications of this recognition of home economics education as a form of vocational education in terms of schools and of courses of study. This discussion will then deal first with the essentials of this form of vocational education in which instruction is to be given, and for which teachers are to be prepared; and, second, with the essentials of the plans for teacher-training to be carried out under the Act.

We all understand that vocational education means special education for a special occupation—specific training for a specific job,—and that it includes all forms of special education whose "controlling purpose," in the words of the law, "is to fit for useful employment." Stated in terms of the field which we are considering, home economics education as a form of vocational education must have for its controlling purpose the preparation of girls and women for the duties and the responsibilities of the homemaker and the house-daughter as practiced in the occupations and the management of the home.

Looked at from this point of view home economics education is largely a new form of education. New forms of education demand new courses of study, appropriate methods of instruction, and special qualifications on the part of teachers. How are we to set up these new courses of study? How determine upon appropriate methods of study? What are the qualifications which are essential for teachers of home economics subjects in vocational schools?

Fortunately, the acceptance of home economics education as a form of vocational education sets up as its controlling principle certain established principles of vocational education.

(a) The controlling factor in determining the subjects to be included in a course of study designed as preparation for an occupation must be the vocational needs of the persons who are to follow the occupation.

(b) The central feature of such a course of study must be not those subjects which everybody needs—that is the way we make a course of study for general education. The central feature of such a course of study must be a group of subjects which the especial group needs,—a group of so-called vocational subjects.

(c) A third principle of vocational education demands that the central group of vocational subjects must be supported and supplemented by a group of related subjects.

(d) And further, since all special groups of people are citizens with community interests, they have need for some subjects from general education to make out a well-rounded course of study. These are denominated non-vocational subjects. We now have a course of study designed for vocational education set up in three groups: vocational subjects, related subjects and non-vocational subjects.

In preparing a course of study for any given occupation the vocational subjects to be selected can only be determined by an analysis of the oc-

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cupation. Such an analysis, then, would be the first step. With the vocational subjects determined upon, the group of related subjects would next be selected to support and supplement the vocational subjects. This is in order more fully to satisfy the vocational needs of the pupils and at the same time to satisfy their educational needs. It is not enough that drawing, mathematics or science or art courses be required in the course of study. If such courses are to render their full service in the vocational preparation of the pupil, the subject-matter must be arranged and presented to bring out essential relations and applications to the special occupation. Although non-vocational subjects should be chosen primarily to satisfy educational needs common to all, even such subjects can be given larger significance and the quality of both instruction and accomplishment greatly increased by being related to the vocational subjects which the pupils are pursuing.

Now to apply these principles to home economics education. We have need for new courses of study. The controlling factor in determining the subjects to be included must be the vocational needs of home-makers and house-daughters. The first step is an analysis of the occupation. I wonder how many of you have thought about it—about what makes up the occupation of home-making, the oldest and almost universal occupation of women! And further, I want to make it quite clear that the occupation we are talking about, the occupation we are attempting to analyze, is the occupation of 92 percent of our home-makers, the women who do their own work.

As I see it, there are a number of skilled occupations included in the vocation of home-making and, besides, it is a social and a business enterprise. Under ordinary circumstances, the efficient home-maker must be a reasonably skilled worker in four or five skilled occupations. Under emergency conditions others are added. In addition, she is joint owner and manager of the whole enterprise. Manifestly, the duties of the home-maker as a skilled worker and as a manager so overlap that they cannot be entirely dissociated. But for the sake of clearness in this analysis we shall look at them separately.

The efficient home-maker must be a skilled worker in general housekeeping. As such her duties include the care of the house and its equipment. She must be a skilled worker in preparing and serving food. As such she provides three meals a day. Her responsibilities as a seamstress and as a dressmaker are not so clear as formerly. But notwithstanding the fact that the making of clothing is steadily going out of the home, it would appear that the services of the home-maker as a seamstress for the remaking and the care and repair of clothing will continue to be an occupation essential in the average home. The fourth occupation demands the highest degree of skill and is the most important of all,—the care and rearing of children. The fifth is at times a part of the responsibility of all home-makers, the care of persons who are ill,—the occupation of the practical nurse.

As a manager the home-maker is responsible for the character of her enterprise. She is largely responsible for determining the standard of living and the product the home will turn out. She is usually the chief influence in determining whether or not the home will devote its energies to "saving"; to health; to securing higher education for the children; to "keeping up appearances"; or to "having a good time." She is a partner

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in the business and usually the business manager. As such she must budget the family expenditures and keep the household accounts. She is the superintendent of the plant, planning her own work, the work of the members of her family, and the work of employees, when she has them. She is the educational manager, the welfare, the social manager of the family group.

The foregoing analysis would seem to make quite clear the dual character of the qualifications and the responsibilities of the home-maker; hence, the dual aspect from which adequate vocational training must be viewed. Manifestly, the vocational needs of this group are skill in the household occupations and knowledge essential to efficient management of the home. The course of study designed to meet these needs must, therefore, provide for instruction and practice in the home occupations and instruction in such subjects and subject matter as will supply the needed background of information.

The household occupations have been enumerated. Knowledge essential to efficient management would include: information concerning the source, manufacture and economic value of the materials used in the household; a working knowledge of such scientific principles as underlie sound household practice and are essential to adequate provision for the nutrition and health of the family group; a working knowledge of those principles of art which underlie wise, tasteful and hence economical selection of clothing and house-furnishings; some understanding of the responsibilities of parents and of older brothers and sisters for the moral and mental development of children. And, if the home is to be efficient as a social as well as an industrial and business enterprise, knowledge essential to the management of a home would also include such an understanding of civic and social conditions and obligations as will make the home-maker conscious of her responsibility and the responsibility of her group as members of the community.

It remains to determine the subjects which should make up such a course of study. The group of vocational subjects will provide "practical work," and will include instruction and practice in the home occupations together with "related instruction" dealing with the materials employed and the application of principles of science and of art to sound household practice. Such subjects are: house-keeping or housewifery, food study and cooking, sanitation and home-nursing, dietetics, garment-making, textiles, dress-making, millinery, house-planning and house-furnishing, home-management.

The group of related subjects will supplement the vocational subjects through providing a background in the knowledge of the fundamental principles of science and art which relate to household practices and the management aspects of the household occupations. Such subjects are: general science as applied to the household, drawing and design as applied to clothing and the home, household accounts, household chemistry, household physics.

The group of non-vocational subjects will vary under differing conditions—but such subjects as civics and citizenship, elementary economics and elementary sociology are of especial significance to this group of pupils since they furnish the knowledge of civic and social conditions and obligations essential to an understanding of the community responsibilities and obligations of the home-maker and of the family.

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The law provides for instruction in home economics subjects in three types of schools—day schools, part-time schools, and evening schools. In the day schools, "at least half the time must be devoted to practical work on a useful or productive basis." The plan is subject to some modification for cities of less than 25,000 population. Already in a few cities, we have vocational schools, or vocational departments attached to high schools, which are offering two-year courses in home-training in which half the time is devoted to practical work and related instruction in home economics subjects. The remaining half day is devoted to instruction in related subjects and in non-vocational subjects. It is believed that this departure from the course of study generally offered in the upper elementary grades and early high school grades provides a more adequate type of education for certain group of girls now in these grades and that it will serve to keep in school or attract to the schools groups of girls which now drop out as soon as the law will permit.

The part-time school is designed to meet the needs of workers over 14 years of age who have entered upon employment. For girls this means the groups who have left school and who are employed as house-daughters or in wage-earning occupations. The law prescribes that instruction shall be given for not less than 144 hours per year—that is four hours a week during the school year. In several states instructions in home economics subjects is required for all girls in the continuation schools. This presents a new problem. As yet the subjects chosen and the methods of instruction are similar to those of the day schools. In my judgment, careful study of the needs of these groups will indicate adaptations of subject matter, and of methods of instruction which will greatly increase the efficiency of the instruction as training for home-making and for life as a wage-earner.

If we are entirely fair, I am sure that we shall acknowledge that the evening school offers, after all, a more perfect type of vocational education for home-making than either the day school or the part-time school. Evening school instruction must be supplemental to the daily employment. It is provided for persons over 16 years of age who are at least part of the time in the occupation. Hence, the training functions immediately in the occupation. For the large number of girls in continuation schools or in the vocational schools or departments, home-making is a deferred prospect; and the training does not have the same immediate interest or value.

The course of study for the evening schools deals with the larger topics of the day-school program. These should be presented, however, with a full recognition of the fact that the pupils are older, have had some experience in the occupation, and have immediate need for the instruction. For these reasons, together, with the irregularity of evening attendance, courses of study composed of short unit courses chosen mainly from the vocational subjects have proven to be highly successful.

This has been a rather long introduction. It has seemed necessary to get before us as clear an outline as possible of the types of schools and of the instruction in home economics subjects to be aided, as a basis of discussing the training of teachers in this field to be promoted under the act. Pertinent questions are: What teachers are needed? What qualifications must such teachers have? Or, conversely, what are the essential features of the preparation needed by such teachers? What are the Land-

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Grant Colleges doing now in the way of the necessary training? What more needs to be done?

The teachers needed are teachers of home economics subjects and teachers of related subjects for day, part-time and evening schools and classes. The qualifications of teachers of home economics subjects are, superior skill in the household occupations, knowledge and skill essential to superior home managament and the ability to teach home economics subjects. The essentials, therefore, of plans for the preparation of teachers of these subjects are: (a) vocational or technical training of collegiate grade designed as preparation for employment in the vocation; (b) practical experience in the household occupations; and, (c) professional training for teaching. The Land-Grant Colleges are already preparing teachers of these subjects. They are the chief agency now training these teachers for the secondary schools. It will be necessary to examine the curricula offered, and the methods of instruction employed, in order to determine the extent to which what is now being done is adequate for the training of teachers under this Act and to determine what modifications of the present plans and what additions need to be made.

The qualifications for teachers of related subjects would include: adequate knowledge of the fields of science and of art in which instruction is to be given, a knowledge of home economics subjects and of the household occupations sufficient to furnish the necessary background for relating science and art subject matter to the work in home economics, and ability to teach the necessary related subjects. If teachers are to possess these qualifications, plans for their preparation must include: (a) technical training in the related sciences and art together with training in home economics subjects; (b) adequate contact with the occupation; and, (c) professional training for teaching. The Land-Grant Colleges are not now offering definite courses of study designed to prepare teachers of related subjects for this field. Teachers of science and of art are now teaching some courses in secondary schools definitely adopted to the needs of home economics students. Here again it will be necessary to examine the present curricula as a basis for determining what needs to be done in order to provide adequately for the training of teachers of related subjects.

The factors already indicated as the essential features of plans for the preparation of these groups of teachers will serve as a sort of basis of measurement in examining the curricula now being offered. Applying this unit of measurement, in the case of the preparation of teachers of home economics subjects we shall require: How far do the courses of study now offered provide adequate vocational or technical training for employment in the occupation? To what extent do requirements or curricula provide for the adequate vocational experience which is required in the law° In how far are the professional courses which are offered adequate as preparation for teaching?

Before beginning this survey, it may be well to note that we have in the Land-Grant Colleges the oldest form of vocational education for home-making in the United States. Further, we have in these colleges and in other colleges, probably the best vocational education in this field offered in this country. Also during the past decade, and especially during the five years, there has been a steady trend toward uniformity in the content of courses, in methods of instruction, in the organization of

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courses of study. Observations may now be made concerning curricula in home economics in Land-Grant Colleges which are essentially true of the work offered in a considerable number of these institutions.

The examination of these curricula as technical training for the preparation of teachers of home economics subjects reveals a plan for the vocational education of home-makers consisting of a group of vocational subjects, of related subjects and of non-vocational subjects so arranged as to make up a well-rounded course of study. These curricula are built up around a group of technical or vocational courses, which are designed to meet the needs of prospective home-makers. This group of courses makes up from 25 to 35 percent of a four-year course of 120 credit hours. These technical courses are the courses in home economics subjects which are of the following groups: foods and nutrition; textiles and clothing; shelter and house-furnishing; management. The method of instruction in these courses is that of laboratory practice,—practical work—and related instruction. On the whole, this work is good. There are, of course, some weak spots. Courses dealing with the care and rearing of children are brief and as yet weak. The courses in home care of the sick can be much improved. The courses in home-management will be discussed as a part of vocational experience.

The group of related subjects, known in college parlance as prerequisite courses, includes courses in related sciences and in art and applied art. These courses support and supplement the technical courses, and make up from 20 to 30 percent of the college course. Some progress has been made toward such organization and selection of subject matter as will make of courses in science and in art genuinely related subjects. In a number of colleges, courses in chemistry are being presented as applied to agriculture and to home economics. Courses in biology designed as a basis for physiology, courses in bacteriology as applied to the household and public health, courses in physiology emphasizing hygiene and nutrition are numerous enough to be indicative of the direction in which we are going. The courses in art taught in the Land-Grant Colleges are almost all genuinely related subjects. We are on the way, but it is still far to go.

Nearly all the curricula now under discussion include not only fairly equivalent technical and related courses, but also, certain non-vocational courses chosen for their vocational significance as well as for their educational value. Already some progress is being made toward so organizing and presenting these courses as to relate them to the needs of prospective home-makers and of teachers. Courses in economics in a few schools are being adapted to meet more fully the needs of women. In some cases, courses in sociology include surveys of conditions and of agencies of especial significance to home economics students, such as food supplies, food inspection, garbage disposal, school nursing, the work of the visiting housekeeper, the care of defective and delinquent children, etc., etc. Courses in English partaking of a public speaking character present topics of vocational significance to these students, and courses in journalism give special significance to home economics students, such as food supplies, on home economics topics. A striking lack exists in the fact that very little has yet been done in the way of providing courses in civics and citizenship which emphasize the special responsibilities of the home-maker and of the family. Though not apropos, it may be worth while to observe that of the special curricula under examination, many are guiltless of re-

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quired college mathematics and a few make no requirement of foreign language.

Thus far in this survey we have been looking at present curricula in home economics as vocational education for home-making and hence as technical preparation for teaching. We have found the plan sound and admirable and the work of representative institutions in the main adequate. Some of the weak spots have been indicated. Needed modifications and additions will be discussed later. But notwithstanding these short-comings, the completion of a representative course of study in home economics should give to the graduate such a mastery of the technical and related subject-matter of this field as would enable her to make the necessary adaptations to the needs of the groups to be taught in Smith-Hughes schools and classes.

How far do these same courses of study provide for adequate vocational experience in the occupation? A very considerable amount of practical experience in household occupations is provided through the laboratory work of the vocational courses and through the functions, exhibits and outside work which are always a part of the activities of a department of home economics. But laboratories are unnatural places as the scenes of household occupations. Experience with college activities is desirable and necessary experience for teachers of home economics subjects, but it is not home experience. At the best such practical experience lacks reality and the elements of actual management as they relate to the home. There must be actual home experience preferably before taking, and if not while securing, the college training. Fortunately, it is not necessary, as with agriculture, to live in a special place in order to secure this experience. All children grow up in homes. A very large number of girls are successful and efficient house-daughters. It is the part of the college to determine the character and the extent of this home experience; to require evidence of it, to supplement it and to standardize it.

These same Land-Grant Colleges have already accepted the responsibility and have made considerable beginnings toward meeting it. Although, nowhere, as yet, is practical experience in the home set up as an entrance or a graduation requirement, several institutions are requiring summer practicums of this character and a number of institutions are offering courses in supervised home-management. These courses involve study and discussion of the principles and factors of scientific management as applied to the home, and laboratory practice in the management of a house, or in a few cases in the management of a college cafeteria. The laboratory work of these courses varies in type and extent from the management of a so-called "practice cottage" to that of a full-fledged boarding-house. The practice cottages are financed by the college and are managed by small groups of students for periods of about a week. Some independent business enterprises provide a home for groups varying from eight to twenty in number. They are managed by students for periods varying from one to two and a half months and they are maintained by the income which the business earns. Inasmuch as this work is college laboratory work, it goes without saying that it is conducted under the supervision of a competent instructor.

In answer to the question concerning practical experience, this survey indicates that the present curricula in home economics, as a rule, do not provide for it adequately, either through home experience or courses in

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supervised home management. In developing work to meet this need the following points should be given consideration. Summer practicums should be planned to supplement previous experience and class instruction. Courses in home management should involve actual management of real projects. They should include not only participation in the household occupations, but responsibility for general management and for financial management. They should be maintained for periods sufficient to supplement and standardize practice in the household operations and management. They should be genuine business enterprises, managed under a budget system and maintained as going concerns. Under such conditions, courses in supervised home-management bear the same relation to preparation for home-making and the technical training of teachers as do courses in practice teaching to preparation for teaching.

Our next inquiry relates to the provision made in the Land-Grant Colleges for the professional training of teachers of home economics subjects. The phrase "professional training" used in connection with the preparation of teachers is generally accepted as meaning a group of so-called professional courses—courses in education. In the case of students of home economics, this group of courses is not a part of the regular home economics curriculum, but comprises the group of teacher-training courses offered for students who are preparing to become teachers.

But before entering fully into the discussion of these professional courses, there is still one point concerning which we should again examine the regular home economics curriculum. It pertains to professional training and relates to appropriate methods of instruction in vocational courses. Many of you will recall that from this platform in 1915, President Hill of the University of Missouri reported the results of a survey or study concerning the relation of professional training to success in teaching.* He said, if I remember correctly, that it was found that teachers who had had no special courses, but who had pursued college courses similiar in organization and method of instruction to suitable high school courses, were as successful as teachers as were the teachers of other subjects who had pursued special method courses following college courses which were conducted on a plane different from that suitable for secondary instruction. It is the old story. Example is stronger than precept. We are to a slight extent teaching the elementary vocational courses in home economics after the manner in which efficient secondary work should be done. But in the main we are dissociating laboratory work and related instruction. We are having laboratory exercises on Tuesday and Thursday and lectures in the same course on other days of the week. The lectures deal with topics related to the laboratory work. But it is not possible to maintain the quality of interrelation which is desirable and which is possible when the time devoted to laboratory, lecture and recitation is provided as lump time to be utilized for any type of class exercise which the nature of the work demands. We must not lose sight of the fact that adequate related instruction is a fundamental principle of vocational education. We shall not be filling the full measure of our responsibility in the training of teachers until we do all that may be done through the most efficient methods of instruction in vocational college courses.

To return to the consideration of professional training. The courses offered vary in the different states both in character and extent. The varia-

*Proceedings 29, pp. 96-100 (1915).

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tions are due to statutory requirements, to local points of view and to local limitations. Everywhere, however, they include certain general courses in education, and special courses for special groups of students, together with somewhat of experience in teaching—called practice student teaching. The legal requirements for certification vary in extent from 10 to 24 credit hours on the basis of 120 hours constituting the college course. A recent examination of these statutory requirements indicates that 15 hours constitute the average.

It is doubtful if any one knows just what these courses should include. Expert judgment changes with changes in our educational philosophy. There was a time when we believed that the study of psychology and of the history of education would prepare for teaching. At the present time there is a pretty general consensus of opinion as to the larger essentials of this professional training. This would include an understanding of the nature and of the habits of the mind; of the educative process; of accepted methods and standards of instruction. It would include also a knowledge of the aims and organization of the public school system. For prospective teachers of special subjects it would include knowledge of the special problems and methods of the special field, together with practice in teaching under skilled supervision. For teachers of home economics subjects this would probably mean somewhat of psychology; somewhat of the principles of education; some study of the American school system; a survey of the principles and methods of vocational education; special study of the organization methods and problems of home economics education in day schools, part-time schools and evening schools; and supervised student teaching.

Many of the Land-Grant Colleges are offering to home economics students courses in education aggregating 15 credit hours. But there are few courses offered dealing with vocational education. Courses in special methods in home economics education are weak. And a very few institutions are maintaining courses in student teaching which are adequate in extent or of a quality equivalent to the technical courses.

There is a further opportunity for improving the preparation of teachers—a contribution along with many others from the field of industrial education. This is a plan for the improvement of teachers in service. A plan of follow-up work with teachers in service has already been proposed by several State Boards for Vocational Education and undertaken by the teacher training institutions of the States. The plan involves a service to young teachers who have entered employment similar to the work of the critic teacher during the period of supervised student teaching. The details of such work will need to be carefully planned with State Boards for Vocational Education in order that it may not infringe upon state supervision, and yet may give to young teachers the counsel and criticism needed in the first year of service.

Following the order of the questions preferred at the beginning of this discussion we have come now to a consideration of what the Land-Grant Colleges are doing in the way of the preparation of teachers of related subjects; and of what more needs to be done; teachers of two groups of related subjects will be needed. Teachers of related science subjects and teachers of related art subjects. The essentials of preparation are in the one case special training in the related sciences, and special training in certain home economics subjects; in the other, special training in art,

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design and applied art, and special training in certain home economics subjects, the special training in either case to be supplemented by contact with the occupation and professional training for teaching.

As has been said already no special courses of study have been set up for the preparation of these teachers. It is true, however, that the technical courses which would be needed for such a course of study are now being offered in the departments of science, of art and of home economics. All that would seem to be lacking are special methods courses and supervised student teaching in the related subjects. Proceeding from this assumption, teachers of related subjects may be recruited from three groups of students or of teachers; those who have specialized in biological and physical sciences; those who have specialized in art and applied art; those who have specialized in home economics. The special training of the first two groups will need to be supplemented by courses in home economics subjects, special methods courses and student teaching in the appropriate related subjects. The special training of the third group will need to be supplemented by further study of science or of art, together with the appropriate courses in special methods and student teaching. It will become the responsibility of State Boards for Vocational Education, of Land-Grant Colleges and other colleges to make known the need for teachers of related subjects, to announce the necessary qualifications for such teachers and, further, to provide for the appropriate courses in special methods and supervised teaching in the related subjects.

Thus far in this discussion of the preparation of teachers of home economics subjects for service in Smith-Hughes schools and classes, we have considered only preparation of collegiate grade covering a period of four years. And we have had in mind the preparation of teachers for the day schools. This preparation is desirable for all teachers of these subjects. But, if under the stimulation of federal aid and of state aid the part-time and evening schools develop as it is expected they will develop, we can not hope to secure the necessary number of teachers with this preparation. Nor, is it probable that the reward of the service will be sufficient to induce a sufficient number of persons to seek training of four years' duration. Hence it will be necessary to provide shorter courses of training specially designed for the preparation of teachers for part-time and evening schools.

These are new and separate undertakings. There is not as yet sufficient experience upon which to determine all the conditions of adequate training. Certain facts and the experience gained from the schools of these types which have been established indicate some fundamental considerations. The instruction offered in the continuation schools designed to meet the needs of young people between the ages of 14 and 18 who have entered employment, is of a relatively elementary character. It approaches that of the upper elementary grades and junior high school. Preparation of collegiate grade covering a period of two years is generally accepted for teachers of elementary school subjects and for teachers of home economics subjects in the elementary schools and junior high schools. The conditions of instruction are less uniform and less defined than in the regular schools or in the day vocational schools. Hence there is a greater need for experienced judgment, for resourcefulness and for knowledge upon the part of the teacher of the home conditions and conditions of employment of the pupils. There is also need for a thorough understand-

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ing of the aims and problems of vocational education, together with a deep sympathy with them. There will probably be full-time employment for the teacher of home economics subjects in the continuation schools of the larger cities; but in small cities the service will be a part-time employment unless the teacher of home economics subjects is prepared to teach other subjects.

From these considerations it would appear that two-year courses should be developed for the preparation of teachers for part-time schools; that the curricula set up for such two-year courses should in additon to the fundamental technical and related courses, give special emphasis to a study of industrial employment and to the needs of the girls who attend the continuation schools; that the teacher-training institutions should give serious attention to the development of some agency for the purpose of attracting to this service mature women of generous life experience and, if possible, of successful teaching experience. Probably the greatest difficulty will be to secure teachers for the part-time employment in the smaller cities. It is suggested that an agency for the selection of possible candidates for training might find in most communities married women of normal school training and successful teaching experience who would be willing to take short periods of training and to give this part-time service. For such persons, summer courses can be arranged in technical and related subjects which will supplement previous training and experience and provide a training equivalent to that offered in the two-year special courses.

The preparation of teachers for the evening schools is still another problem. This work is entirely part-time instruction and the teachers must be secured from groups otherwise employed during the day. The teachers from the day schools and continuation schools can frequently be secured for one or two classes a week. But in large industrial centers there must be created a much larger supply of teachers. And, since these will come from persons already employed, they must be recruited from the local community and in most cases prepared for teaching on a part-time or evening school plan.

Experience with instruction in home economics subjects in evening school indicates that teachers of dress-making, millinery, home-nursing, household decoration, may be prepared through short courses presenting the aims of the work, the problems of organization and instruction involved in evening school instruction, together with approved methods of instruction, if persons are selected for this preparation who are of a good general education, good personality and successful business experience. Similarly, experience with evening school instruction indicates that successful teaching of unit courses involving food study, knowledge of the principles of nutrition and of sanitation, and the factors of management demand good technical training. From this it would appear that teachers for these courses in food conservation, sanitation and hygiene, food supply and food preparation, dietetics, household accounts, household management, etc. must be secured through preparation similar to that suggested for the teachers in continuation schools in smaller cities.

It is now my purpose to gather together the points of this discussion which relate to those things which are not being done and which need to be done in Land-Grant Colleges in order to provide adequate preparation for teachers of home economics subjects in conformity with the conditions and purposes of the Smith-Hughes Act.

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In the preparation of teachers of home economics subjects:

The methods of instruction in elementary vocational courses should combine more closely laboratory work and related instruction, substituting for lecture work to large classes more of recitation and class discussion, and the elimination of separate lecture and laboratory periods.

There is a general need for expansion and improvement of the courses dealing with the care and rearing of children, and the home care of the sick.

Adequate vocational experience as required in the law should be provided through a requirement of home experience supplemented by summer practicums and courses in supervised home management. The latter courses should be real projects in home management on a genuine business basis.

Further reorganization of prerequisite courses in related science and art subjects is necessary to provide adequate instruction in related subjects.

Further reorganization of non-vocational subjects will increase both their educational and vocational significance. Courses in civics and citizenship stressing the civic and social responsibilities of women need to be developed.

There is need for the development of courses in education dealing with the fundamental principles, aims and methods of vocational education.

Courses dealing with special methods in home economics education need to be improved and expanded to include study of the vocational needs of different groups and adaptations of courses of study and methods of instruction for day schools, part-time schools and evening schools.

Present provision for supervised student teaching is inadequate. The colleges must develop plans, suited to local conditions, for providing adequately for this essential factor of efficient teacher-training.

Wherever it is possible, the plan for the training of teachers should include provision for improvement of teachers in service for follow-up work by the supervising critic teacher.

For the preparation of teachers of related subjects:

It becomes the responsibility of teacher-training institutions to announce the need for teachers of related subjects and the necessary qualifications of such teachers.

Further it becomes the responsibility of such institutions to arrange suggested courses of study for the preparation of such teachers, and to develop courses in special methods and supervised teaching in appropriate related subjects.

In the preparation of teachers of home economics subjects in part-time schools:

It would appear that present knowledge and experience would warrant the development of special courses, two years in length for the preparation of these teachers.

It would also seem clear that some agency should be developed for securing mature and experienced persons to take this training or

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shorter courses designed to adequately supplement superior qualifications in the way of previous education and experience.

In the preparation of teachers of home economics subjects in evening schools:

Present knowledge and experience would seem to warrant the development of special short courses, designed to supplement successful business or professional experience, in the preparation of teachers of dress-making, millinery, home-nursing, and household decoration.

Similarly, short courses as suggested under part-time schools should be developed for the preparation of teachers of the applied science groups of subjects for evening schools.

If under the stimulation of federal aid for the preparation of teachers in the field of home economics education, such modifications and additions to present plans as has been indicated may become effective, together with others which experience will determine as necessary or desirable, we shall secure in vocational schools and classes a superior order of vocational education for home-making. If, further, the plan for teacher-training provided for under the Smith-Hughes Act can be extended to the training of all teachers of home economics subjects, as it may be, at least in Land-Grant Colleges, it will greatly improve instruction in these subjects in other schools and classes—"A consummation devoutly to be wished."

THE PRESIDENT. Dean Alfred Vivian, chairman of the State Board of Education of Ohio, will now set forth the point of view of "The State Board."

THE SMITH-HUGHES ACT. THE STATE BOARD

BY ALFRED VIVIAN.

The subject first assigned to me was the Smith-Hughes Act from the point of view of the college of agriculture, and after a paper under that title was well under way the subject was changed to the present one, namely, the Smith-Hughes Act from the point of view of the State Vocational Board. It is practically impossible for one in my position completely to divorce these two points of view and during this discussion both of them will probably be more or less in evidence.

The three principal functions of the State Boards of Vocational Education are undoubtedly:

(1) To see to it that the federal and state moneys are so placed as to give the greatest impetus to vocational education;

(2) To insure the employment of good teachers and the introduction of proper courses of study; and

(3) To provide for the proper training of teachers.

The State Boards will need to take a firm stand if the Smith-Hughes money is not entirely to fail in accomplishing its purpose. Pressure will be brought to bear on all of them to scatter the money over the entire State in such a way as to defeat the very purpose of the Smith-Hughes Act. Our own board has received several letters containing statements like this: "We are wondering how we can best spend the money which will come to our county under the Smith-Hughes Act." If this money is to accomplish anything worth while it must be very carefully placed where it will be used to encourage strictly vocational teaching, and correct stand-

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ards must be maintained even if the number of schools aided at the beginning is very small.

I do not believe that there are many States which will be able this year to use properly all the money that is coming to them. It will take more than one year to get things so organized that this money can be properly used. Then this State Board, if it does its duty, I believe, will see to it that these new schools are coupled up with the existing schools. In other words, they will cooperate with the existing agencies for education; and I believe that any system followed by a State Board of Education that does not keep in mind cooperating with the existing agencies for education will make a very serious mistake. It is not going to be an easy matter to get the teachers to take charge of these schools. In the case of the agricultural school, I think it ought to be conceded at the start that that teacher should be a graduate of a four-year course in a college of agriculture, and that he should have, in addition, practical experience on the farm. Preferably, he should have been raised on the farm so that he may have the point of view of the farmer and the farm boy. In our own case, we have specified that the teacher must have had two years' experience on the farm since he was 14 years of age, which practically means that we will have men who were raised on the farm. It is well known to you that the agricultural teaching of the past has fallen into disgrace. It is considered a joke, in many places, largely due to the fact that so many courses of agriculture have been taught by men who know no agriculture at all. Those of you who attended the meeting of the Society for Promotion of Agricultural Education last year remember that the statistics then presented showed that in 2,150 high-schools in which pretense was made that agriculture was taught, less than 350 of the teachers had received training in an agricultural college, and less than 400 in a normal school. Only one in three of those high-schools giving instruction in agriculture employed teachers who had received any agricultural training whatsoever. It will be difficult to find enough teachers. Consequently, all kinds of influence will be brought to bear to force the acceptance of poorly trained teachers. For instance, the argument is being advanced that a man who was raised on the farm and had a science course in any kind of a college can teach agriculture in the high-schools as well as a man that had had an agricultural course. This argument will be presented in every State; and yet I have the very definite opinion of the county superintendent in one of our large counties who has courses in agriculture taught by graduates of the agricultural college, and also courses taught by men who were raised on the farm and had a science college course, that the men with the agricultural college training are doing work that is infinitely superior to that of the men who have never had that training. I think our teachers of home economics ought to be graduates of four-year courses in home economics. And as the greater number of the good four-year courses in home economics are taught in the Land-Grant Colleges, it follows that on these colleges will fall the heaviest burdens of preparing such teachers. In both cases teachers of some maturity are desired, if they can be obtained. They will be difficult to find. And it is more vitally necessary that the teacher of this vocational work be mature than for the other lines of teaching. And in addition, as was mentioned this morning by three of the speakers, these teachers must be well supervised if the best results are to be obtained.

I do not believe in the separate school of agriculture or home economics.

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I think that these courses ought to be taught in connection with the existing high schools.

When it comes to the training of teachers, I think we are all agreed, in this body, that the agricultural teachers should be trained in the College of Agriculture of land-grant institutions. I do not believe that I am prejudiced in this matter by the fact that I am connected with a Land-Grant College, because I have tried to go into this thing very thoroughly. I have communicated with scores of people in the United States to get the point of view of everybody concerned, and the consensus of opinion seems to be that agricultural teachers cannot be properly prepared anywhere except in the four-year courses in the College of Agriculture. This is almost true for home economics, as I have pointed out, although there are a limited number of colleges and universities that are not Land-Grant Colleges which are offering good four-year courses in home economics that are well fitted for the preparation of teachers.

When it comes to the industrial side of the question, I think that the teachers of industrial education also in cities of less than 25,000 have to be largely prepared in the Land-Grant Colleges, although here are a few Municipal Universities which could prepare teachers for these positions.

Some of the reasons, if it is necessary to present them, why teachers should be prepared in the Land-Grant Colleges, are as follows: First of all, those colleges are now provided with at least 80 percent of the equipment that they need for the preparation of teachers. No other schools in the country are so equipped. Most of the courses in the Land-Grant Colleges are already practical in character. Their teachers have the practical point of view, and in the best of these colleges the technical courses are taught by men who are sympathetic with the vocational idea, so that these technical courses even have a little of the vocational flavor.

In the case of agriculture, another reason why the Land-Grant College is the place to prepare the teacher is the fact that the extension services are located at these colleges. The fund of information that they have been able to collect concerning the State enables college instructors so to shape their courses as to relate them closely to state conditions, and consequently to send out teachers with the point of view of the particular State in which they are to teach; for it is to be assumed, speaking broadly, that all the teachers are to be used in the home State. There will be the temptation for States to rob each other of teachers; but there will be so many positions and so few trained teachers that every graduate of one of these courses who is at all qualified will find his job waiting for him at home.

The Land-Grant Colleges, when you come to think of it, gave the first stimulus to vocational education. They were the first really vocational educational institutions in our country. They can give to the students the rural point of view. Was it not Dean Bailey who said that "the Land-Grant Colleges of America have made the greatest contribution to constructive pedagogy of the last century?"

Now, to meet this situation some little change must be made in our courses of study, as has already been hinted by another speaker. All of our colleges must do what some of them are now doing, namely, they must present a general survey course in each field, which, by the way, is good pedagogy for the regular students as well as for the student who is preparing to be a teacher. The fact is that the teachers of education today are coming to the conclusion that in science, and applied science as well,

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the first course in any subject should be a general course that gives to the student a survey of the field. After some years' experience in teaching chemistry in that way, I can give the assurance that the student progresses more rapidly in that science if in the first course the student is given an idea of what is comprehended in chemistry in general. This works better than to lay the first brick upon which the next one will be placed in order to build up a continuous course in chemistry. Every department in the College of Agriculture with which I am connected, now presents a first course which gives a general survey of the field of that department and it is the only course in that line that is required of all students. Of course each student is allowed to elect further work in any department he desires.

These colleges must present good courses in agricultural education. Many of them already have offered these courses; but, as was suggested by Mr. Hawkins, we must make especial preparation for practice teaching, and that practice teaching must be under conditions as nearly as possible like those that the teacher will meet in the field. We are undertaking to solve that problem by using seven or eight schools located near Columbus, which can be reached by the trolley, placing there the best teachers of vocational agriculture that we can find and appointing them on our staff as critic teachers. The student teachers are sent out for practice teaching under these critic teachers.

I think that to make this plan work properly, the head of the department of agricultural education should have a free hand in the presentation of such professional courses as are necessary to the teacher, and the professor of agricultural education should have a cooperative voice in planning the technical and agricultural subjects that are to be presented to the prospective teacher. In other words, I think that the professor of animal husbandry or agronomy who does not consult with the professor of agricultural education in arranging his course is making a mistake, for in many cases these courses would be made much better than they are if he would consult a man who has had training in professional educational subjects.

The professor of agricultural education also ought to have the privilege of using the equipment of the other departments for part of his work in his teaching courses. In other words, the prospective teacher should learn his animal husbandry from the department of animal husbandry; but when the professor of agricultural education undertakes to show that prospective teacher how to handle that subject in the high school, if he has the privilege of going into the department of animal husbandry and using the animals—not to teach animal husbandry, but to show the student how he ought to handle it in the high school—it will be distinctly to the advantage of both teacher and taught, and I do not think it will hurt the department of animal husbandry in the least.

Another thing that is needed is to correct the tendency to require excessive amounts of professional work for the prospective teacher. Twenty to thirty hours are more than an undergraduate needs to devote to training in professional educational subjects. I think that these subjects can be handled into a much shorter period of time without lost efficiency. Within reasonable limits it may be said that the value of courses is about in inverse ratio to the number of credit hours which they carry.

In spite of what was said this morning, I am of the opinion that the

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best supervisors of agriculture and home economics teaching are the teachers of these subjects in the colleges. I know that the Federal Board stands for a separate supervisor of agricultural teaching distinct from the college, but I believe that the man who is teaching agricultural education in the college will make the very best supervisor of that work out in the State; and the same thing holds true of home economics. Of course, such a supervisor should be directly responsible to the State Board of Education for such part of his time as is devoted to the supervision of vocational teaching in the State. This means, of course, that the corps of teachers of agricultural education must be increased; but I do not believe that any man who is not in close touch with the actual preparation of teachers will be as valuable a supervisor as one who is occupied in preparing teachers.

So many good things have been said about the Smith-Hughes Act that I have reserved the privilege of saying some things that are uncomplimentary about it.

Its wording is in some ways very unfortunate. You remember its history. It was written as a law for the promotion of industrial and trades education. Pressure was brought to bear later to introduce agriculture; and then, as was suggested this morning, at the last minute home economics was also introduced. These new subjects, however, were introduced into the old bill without rewriting. Amendments should have been made to the bill setting off the material in separate paragraphs in such a way as to overcome the handicap that agricultural education and home economics education must labor under as the Act is now shaped.

The enactment is based throughout on the trade-school idea. The Federal Board is interpreting it strongly in this direction, namely, as a trade-school law, in spite of the fact that agriculture and home economics are not and never can be trades, being arts, based on broad scientific foundations. Plumbing can be taught as a trade, printing, perhaps, can be taught as a trade; but it is absolutely impossible thus to teach agriculture, underlain as it is with science. Agriculture is a business as well, and the trade side or production end of farming is only one phase of the complicated business organization which is necessary to successful farming. Such a business can not be learned through the trade-school method of instruction.

Another thing which should be kept in mind is this, that a man working at a trade, when he closes up shop at night, goes home and gets away from that trade. The farmer, when he gets through his work at night, has his home right there on the farm. In other words, agriculture is a mode of life as well as a means of earning a living, and to teach this by trade-school methods, in my opinion, is absolutely impossible.

The boy comes to the course in agriculture with a large background of experience—very much more experience than the boy or man who goes to the trade school—and that background of experience which he has been acquiring for 14 years ought not to be ignored. Every trade school of agriculture that I know anything about has failed; and several of them have been tried in this country. I think, therefore, as I said before, that it is only the agricultural course connected with the existing high school system that will ever be a success in teaching agriculture. We can not assume that the boys want to be farmers. If a boy comes to take a course in plumbing, he wants to be a plumber. If he comes to takes a course in printing, he wants to be a printer. But the fact of the matter is that the boys on the farms do not want to be farmers, and the biggest job that

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we have on our hands is to persuade them that they ought to be farmers. For that reason I am saying, and I repeat here, that more important even than this high-school work in agriculture is the work in the seventh and eighth grades, the work that will give the farm boy a vision of what farm life might be. We need there a course that will idealize farm life and will get that boy so interested in it that he will be willing to go to the high school or the college to secure preparation for his life work. The greatest problem we have before us today as teachers of agriculture is to change the attitude of country people towards country life, and one of the best means of doing that is to begin agricultural education in the grades.

The plans for the administration of the vocational work within the States must be prepared by the State Boards for Vocational Education and submitted to the Federal Board for its approval. The restrictions of the Smith-Hughes Act are of such a nature, however, that the State Boards do not have so much liberty in the planning of their work as they would appear to have at first sight. Our plans which have just been approved by the Federal Board, therefore, do not represent what we really want, but the nearest approach to our desires which will fit the requirements of the Federal Board in its interpretation of the Smith-Hughes Act. It is only fair to state that the officers of the Federal Board have seemed sympathetic with our point of view, but have felt that the Act gave them but little latitude in some of the matters about which we were most concerned. They have been most generous of their time and helpful in all possible ways to the State Boards. The point is that the Act itself is radically wrong in some of its features and should be so amended in the near future as better to fit the educational situation than it does at the present time.

It is to be hoped that the Federal Board will give the State Boards the broadest powers which are possible under the Act. The States should be placed upon their own initiative as far as possible, not only in the supervisory work but in the development of the courses of study best adapted to their local conditions. The modern idea is that the school should serve the community and to do this in the best way the school curriculum should be designed to meet the needs of that particular community. Legislation at any distance tends to cause friction, and for that reason all possible legislation should be delegated to the States. The spirit of the law is the important thing and not the mere details of administration.

The attitude taken by some people in discussing vocational education is unfortunate. They seem to assume that those in control of the existing school system must be held under suspicion in matters concerning vocational education, and that they may attempt to divert Smith-Hughes funds to non-vocational uses. The people of this country are strongly in favor of vocational education as are many of the men in charge of the present school system. Their hearty cooperation will be given in carrying out the spirit of the Smith-Hughes Act.

The attention of the Association of American Agricultural Colleges and Experiment Stations should be called to the fact that this measure is so worded that any activity now carried on by the extension services could be conducted under the Smith-Hughes Act. I am afraid there are a few States where this fact is bound to cause trouble. It is to be hoped that in every State a close working arrangement may be consummated between those who administer the Smith-Hughes Act and those who admin-

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isters the Smith-Lever Act, so as to prevent the duplications of effort and the friction that would result therefrom. The work under the former enactment should be closely correlated with the work under the latter. One man who was over-enthusiastic about vocational education, said that when this Act gets into full motion it will do away with the county agents and with the boys' and girls' clubs. Now I do not think anything of that kind was contemplated. It would be unfortunate for anybody to go away from this meeting with the impression that the Federal Board or anybody else who had anything to do with the writing of the bill had such a thing as this in mind; and yet it is plain that unless these interests are correlated in the States, it is possible for such things to happen, or for friction, at any rate, to take place. There is room for all in our scheme of education. There is a place for the present schools, for the extension activities and for the vocational schools. There is no reason for antagonism between those in charge of any of these activities, but every reason why all should unite to make the complete educational system of our country the best to be found anywhere in the world.

Comments on Address of Dean Vivian on the Relation of the State Board of Vocational Education to the Smith-Hughes Bill

By L. S. Hawkins

(Pages 116-122)

A careful comparison of the papers making up this symposium shows an almost unanimous opinion concerning the question of the preparation of teachers. What is here stated in the way of comments on Dean Vivian's paper is not in any sense an attempt to dispute or contravert any of the points which he brought out, but an amplification of some of his statements.

Supervision and teacher-training. It is quite probable that some of the best supervisors of agriculture and home economics teaching will be recruited from the ranks of teachers of these subjects in the colleges. It is also quite certain that the man who is in close touch with the actual preparation of teachers will be more valuable as a supervisor than a man who does not have such an opportunity. On the other hand, the person in charge of the training of teachers of agriculture should be in close touch with the actual conditions existing in the schools for which he is preparing teachers. In the States where the number of persons preparing to teach is small and the schools to be supervised are few, one man may perform this double duty. Where the services of more than one person is needed to carry on teacher-training and supervision, it would be a great advantage from an administrative standpoint to have the supervisor under the direction of the State Board for Vocational Education and the person in charge of teacher-training under the direction of the institution charged with the preparation of teachers. The latter arrangement would not preclude the possibility of having the supervisor closely in touch with the training of teachers and the teacher-trainer closely in touch with the schools giving vocational instruction. In the last analysis this is always a matter of cooperative relationships established within each State between the supervisor representing the State Board for Vocational Education and the department of agricultural education representing the institution

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charged with the training of vocational teachers. As a matter of fact, unless these two persons are working in close touch and harmony there can never be built up a very efficient system of vocational agricultural education in a State. It must be kept in mind that one of these pieces of work is primarily administrative and the other primarily instructional. However, the administrator as a part of his work, in order to fulfill the functions of his position, must aim to improve the teaching, and the instructor, in order properly to prepare those under his instruction, must be thoroughly familiar with the administrative phases of the system of schools for which he is preparing teachers.

The State Board is an administrative body and is responsible, through its agent, for the supervision of vocational schools receiving federal money under the Smith-Hughes Act. The agent acting for the State Board is then primarily an administrative officer and presumably would be charged not only with the supervision of the vocational schools but also the teacher-training. The institution which prepares vocational teachers is an instructional center and the person in charge of vocational teacher-training is dealing with a particular phase of instruction which is a part of the educational plan of the institution. This part of the plan is under the supervision of the State Board for Vocational Education.

It must be said that from the standpoint of results, the plan which contemplates that one and the same person shall be in charge both of supervision and teacher-training has both its advantages and disadvantages. The advantages are that where one and the same person is supervising the agricultural schools of the State and directing the teacher-training, the preparation of the teachers is quite sure to be in accordance with the conditions as they exist in the schools. Furthermore, the person who is doing the supervising is acquainted with both the strength and the weakness of each of the candidates for teaching positions, and in addition knows the conditions in the schools to which these prospective teachers are to go. This makes for getting the right man in the right place. On the other hand, there is but one point of view in the teacher-training and the supervision and the supervisor is more than likely to overlook the faults of the teachers whom he himself has prepared than he would be to overlook the faults of teachers whom some one else has prepared.

To summarize: Where one person can carry on both supervision and teacher-training, it is undoubtedly the most satisfactory arrangement. Where the services of more than one person are required for supervision and teacher-training it would be better to have one person in charge of the supervision and another person in charge of the teacher-training with proper cooperative relationships between the two.

Elementary agriculture. There is no doubt that as viewed from the standpoint of instruction in agriculture the work of the seventh and eighth grades is fully as important as that in the high school. The Smith-Hughes Act does not provide for all the necessary instruction in agriculture of less than college grade. It aims at only one part of this problem, namely, the vocational part. It provides only for instruction of persons over 14 years of age. There is still need of a nation-wide plan for systematic instruction in agriculture for persons between the ages of 10 and 14. It is well recognized in the States, however, that the instruction of pupils under the age of 14 is properly of a general rather than of a special character. Any instruction of a vocational nature given to pupils

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under 14 is usually termed pre-vocational and is more in the form of giving experience and instruction as a basis of intelligent choice of vocation than actual preparation for the vocation itself. In other words, the instruction contemplated by the Smith-Hughes Act is for persons who have developed physically and mentally to an extent which will enable them to profit from instruction pointing directly toward a vocation.

Concerning the advisability and almost the necessity of supplementary legislation which will provide for the other phase of this problem, there can be little question. We might even go further and say that there ought to be some legislation looking toward the betterment of rural schools in general. At present, however, we will necessarily have to satisfy ourselves with having at hand legislation covering a portion of the field of agricultural instruction of less than college grade, and leave to the future such additional legislation as may be necessary to completely meet our needs.

The trade school idea in agricultural education. The position of the Federal Board with regard to the relative merits of the separate secondary school of agriculture and the department of agriculture established in the existing high schools can be very briefly stated. For a boy who has had little or no farm experience some arrangement needs to be made whereby he may gain this first-hand experience in the practice of agriculture. One way in which this may be done is the establishment of a separate secondary school maintaining a farm and the necessary stock and machinery to equip it.

For "the boy who comes to the course in agriculture with a large background of experience—very much more experience than the boy or man who comes to the trade school—that background of experience which he has been acquiring for 14 years and which ought not to be ignored," there is little doubt but that for the greater part of the department in the high school where this boy may continue his experience on the home farm is highly desirable.

As to the encouragement which has been given to the establishment or support of these two types of schools, it can only be said that present indications are that approximately nine-tenths of the money expended under the provisions of the Smith-Hughes Act for instruction in agricultural subjects will be expended for the salaries of teachers of agriculture in the high school and one-tenth for the salaries of teachers in secondary schools of agriculture.

Vocational instruction and extension work. It should be noted that the activities now carried on by extension departments of the agricultural colleges include certain lines which will probably lay the groundwork for pre-vocational instruction in much the same way as these activities have in many instances laid the groundwork for vocational instruction. This applies particularly to the boys' and girls' club work and the short-term extension schools. There can be no doubt about the advisability of having a working arrangement between those who administer the Smith-Hughes Act and those who administer the Smith-Lever Act within a State. There should be no friction or antagonism in the administration of these two enactments. Quite to the contrary there is every reason why the work carried on under the provisions of these two pieces of legislation should supplement and further each other. The United States Department of Agriculture and the Federal Board for Vocational Education are extremely

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anxious that there shall be such unity in the administration of these two Acts, in so far as the Federal Departments are concerned, that they shall both work to the common end of the promotion of a nation-wide system of agricultural instruction. Arrangements are now being made through conference for this cooperation. Both the extension activities of the college and the vocational schools should be an integral part of a state system of education and as such play their part in meeting the education needs of that State.

Cooperation between State and Federal Boards. The Federal Board has shown every disposition to give to State Boards the broadest powers which are possible under the law. The spirit as well as the letter of the law has been taken into consideration in dealing with this question. Owing to the shortness of the time which was available for the preparation of plans for the current year, it is true that the staff of the Federal Board has given more advice and assistance in formulating state plans than would have been the case if these boards had had plenty of time in which to satisfy local conditions. Undoubtedly as time goes on the standards and qualifications and possibly the general plan will need to be modified, but whenever and wherever such modification will serve better to promote the interests of vocational education in a State there will always be the readiest response on the part of the Federal Board to such proposals.

THE PRESIDENT. "The Organization of the Veterinary Corps in the United States Army" will be explained by Major David S. White, late Dean of the College of Veterinary Medicine of the Ohio State University, who is now in the Veterinary Corps of the National Army.

THE ORGANIZATION OF THE VETERINARY CORPS OF THE NATIONAL ARMY

BY D. S. WHITE

Why do we need a veterinary corps in the National Army? Even though the United States use no cavalry at the front, we are employing more animals per men in this great war than in any war in history. For each three and a fraction men in the National Army there is one public animal. If we raise an army of three and a fraction millions of men a million animals will be required. To conserve the health of so large a number of animals in order that they be kept in a most efficient state, is a tremendous problem.

In the old army, the United States Army, no adequate preparation was made in the veterinary service to meet such a crisis as we now face, although since the time of Abraham Lincoln it had a limited veterinary service in that veterinarians were attached to regiments of mounted troops. This army was very small. In fact in a European sense it was not an army at all but a federal constabulary, split up into agile units containing each a few men whose function it was to protect the people of the frontier against the encroachments and ravages of hostile Indian tribes and white renegades. Except for the Spanish-American war, which was successfully adjudicated by volunteers, our country seems not to have felt the need of an army. The profession of the soldier was looked upon askance by the people who felt comfortably secure on account of our supposed fortunate geographical location away from close contact with the powerful nations of the earth.

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The veterinarians in the old service, attached to mobile organizations and remount depots, served as regimental officers only. Until recently they were refused that absolute essential of getting things done in the military establishment, namely, rank. They occupied a unique place in the army, being neither commissioned officers nor enlisted men. They stood between a cadet and second lieutenant. In all matters, professional as well as military, they were always subservient to officers of the line who in many instances refused even to follow their advice. Not until after the Spanish-American war did they wear a uniform. Obviously there was no organization among them. Each man acted independently, bearing about the same relationship to the military outfit to which he was attached that the family physician does toward his clientele. The function of the army veterinarian was to treat the sick and injured, and little, if any, effort made to prevent animals becoming sick, the real function of a veterinary officer.

The mobility of an army depends upon its slowest unit. The rapidity with which a convoyed fleet of ships crosses the Atlantic is measured by the speed of its slowest vessel. Under the method of doing things veterinary in our Army the sick and injured remained with the mobile units, impeding their progress and reducing their fighting efficiency. During the times of Indian warfare this mechanism may have sufficed, but for present conditions it can but bring "comfort to the enemy."

In 1916 Congress passed an Act which provided that there should be established in the medical department of the Army a veterinary corps, and granting to veterinarians, who had passed rigid mental and physical examinations, commissions as officers with rank up to and including that of major. Just why this corps was not organized as a separate department and made an autogenous entity with proper authority and responsibility is largely due to a misconception of the true function of such a corps and the pronounced ultraconservatism which has always characterized our Army.

Placing the veterinary corps in the medical department was not without its compensation, for it threw it into the hands of a great man, Major General Gorgas, Surgeon General of the United States Army. General Gorgas, upon whose shoulders was placed the responsibility which this legislation entailed, was quick to recognize the importance of an adequate veterinary service and the necessity for its proper organization. Among the one hundred veterinary officers of the old Army none was available to undertake the work of completely organizing the veterinary corps along the most modern and approved lines. When the present crisis became imminent, which precipitated the immediate organization of army service, General Gorgas, realizing the impossibility of organizing from within, felt called upon to enlist outside aid. Accordingly, the administrative heads of the veterinary departments of three great universities which had fostered higher veterinary education, were called to Washington to act as an advisory board and assist in organizing an efficient and adequate veterinary corps for the National Work. This board began its work last August. As nothing existed in our own Army which could be used even as a nucleus for such an organization, it became necessary to canvass foreign armies, note what each offered in the way of veterinary service and shape the plan of organization as the result of this study. It was soon decided that the best in this regard was offered by the British Army. In this Army exists a veterinary corps which is the most efficient and economical organization of its kind in the world. The development of this corps was the result

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of distressing experiences felt during the Boer war, which like our own was fought overseas, and during which the mortality among army animals was exceedingly great. The efficiency of this corps is evidenced by the record it has made along the western battle front where the losses among public animals have averaged less than that of any other army and where each mobile unit is kept efficiently, adequately and economically horsed.

Taking the British service as a model, the War Department was asked to authorize the creation of the proper personnel and plan of organization. After some delay, this authority was granted, and, as a result, provision was made to allow for each 400 public animals one veterinary officer and 16 enlisted men, placing the new veterinary corps on a percentage basis as are the medical and dental corps of the Army. The size of the corps will therefore correspond to the size of the Army. Experience has shown that these percentages of officers and men respectively will supply adequately not only service in the field but also the necessary administrative officers.

To man the new corps with educated, trained and efficient veterinarians was a formidable task. Obviously we had to draw heavily from civil life. For this there was ample precedent. Ninety-six percent of the officers of the present medical corps of the British Army were civilians when Great Britain entered the war, and over 85 percent in the veterinary corps, a figure which will apply in our own Army.

It is not the purpose of the veterinary corps to treat sick and injured animals wherever they are found. Each mounted organization will have assigned it certain "veterinary units." Each unit will consist of one officer and three enlisted men. The function of the unit is rigidly to inspect daily the animals of its organization, render necessary first aid, and remove all those which are sick and inefficient, turning them over to so-called mobile veterinary sections for evacuation to veterinary hospitals on lines of communication. During action, as many as 300 to 1,000 such animals in each division may be collected at each mobile veterinary section where they are sorted according to the character of the disease or injury each may suffer, tagged and, under escort, sent to rail heads for shipment to hospitals. From the hospitals, after recovery, the animals are delivered to the remount depots from whence they are reissued to the lines. Animals requiring no further treatment in hospitals but not yet recovered sufficiently to return to service are held for a time at convalescent farms until fit. The strong features of this plan are that the fighting lines are promptly relieved of all animals which would impede their operations, to be replaced by healthy and efficient animals, and that all the sick and injured animals receive expert surgical or medical treatment in well equipped, properly manned hospitals.

It has always been customary in our service to place the veterinary hospitals in the remount depots. The function of a proper remount depot is to furnish the lines with healthy and efficient animals. To maintain within it a hospital with its corrals for communicable diseases, etc., is obviously to defeat the object of such a depot. Our Army has outlived the system of placing isolation hospitals in the center of recruit camps, and once the danger of mixing the rotten with the sound fruit is fully appreciated, this old custom will cease to exist. The Boer war was fought under the remount hospital plan of treating animals. Great Britain lost 60 percent of her army animals in that war. In the present war and under

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the new system of handling public animals this loss has been reduced to about 10 percent.

By the time a given horse or mule sees service at the front in France its cost will approximate $600. To the original purchase price of nearly $200 must be added the cost of feed, of care and of transportation, plus the losses caused by disease and death on land and on sea. Further, a much larger percentage than ordinarily is thought will be found to be unfit for severe military service, because of bad conformation, sex, senility and infirmities not usually seriously considered in the much less strenuous civil war. War is a very exacting and extremely strenuous business for both man and beast.

I have endeavored to give you some idea of the work of the Veterinary Advisory Board cooperating with the Surgeon General in building for our Army a well organized, efficient veterinary corps. There is yet much to be done, and much that we have done may never be allowed trial in the field. We have felt keenly the necessity of efficiency in this work, for as never before this country is facing a most formidable foe who "does not fight feebly." The friendly offices of such great men as Presidents J. G. Schurman of Cornell University, W. O. Thompson of Ohio State University, Provost E. F. Smith of the University of Pennsylvania, and President R. A. Pearson of Iowa State College have been of material assistance. Without them it is doubtful if much could have been accomplished. Each was interested not only because in each of their respective institutions were included well organized veterinary schools but also for the reason that they saw the great economic need of a modern veterinary corps in the National Army.

W. D. Hurd of Massachusetts. The Constitution provides that the section on college work and administration shall elect three members and the section on experiment station work two members of the Executive Committee. There has been no change in this provision since the Constitution was thoroughly overhauled in 1902. I now propose the following amendment to the Constitution:

That in the section entitled "officers," subsection (1), line 5, [Thirtieth Proceedings, page 18], the word "and" be stricken out; that a comma be inserted prior to the word "two"; and that there be inserted after the word "work" the words "and one by the section on extension work"; so that the section as amended shall read as follows:

OFFICERS

(1) The general officers of this Association, to be chosen annually, shall be a president, five vice-presidents, a bibliographer, and a secretary, who shall also be treasurer, and an Executive Committee of six members, three of whom shall be chosen by the section on college work and administration, two by the section on experiment station work and one by the section on extension work; *provided*, however, that a member chosen by either section need not be a member of that section. The Executive Committee shall choose its own chairman.

The President. This proposed amendment will take the usual course provided by the Constitution as set forth in the section entitled "Amendments" on page 19.

On motion, a recess was taken until 2 P. M.

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AFTERNOON SESSION, THURSDAY, NOVEMBER 15, 1917

The Convention was called to order at 2 P. M. by the President.

THE PRESIDENT. The subject this Convention has on hand this afternoon is that of "Food and Food Administration." The first speaker is Professor Isabel Bevier of the University of Illinois.

FOOD AND FOOD ADMINISTRATION

BY MISS ISABEL BEVIER

Oculists tell us that it is good for the eye to lift it from the printed page and to take a long look skyward. It has seemed to me, in considering this subject of home economics in the present crisis, that it would be well for us to turn away for a moment from the present crisis and to consider what home economics can do in times of peace. However much our definitions of home economics may differ—all the way from that very long one about the application of science to the home to the brief one I once heard that home economics reduced to its lowest terms was fudge making and poor fudge at that—there are certain general things upon which people have agreed as to home economics in times of peace.

In the first place, home economics is expected to teach the technique of household processes. The world really wants its housekeeping done, it wants it well done, and some way or other it has the idea that when you put together two words, "home" and "economics," you can really do something with the job of housekeeping. It wants, also, what was best in the old forms of life translated into the new; else, why all this study and work and fuss about it? It seems to me that perhaps the best illustration that we have of that interpretation is the difference between the water system and the plumbing system of the modern home on the one hand, and "the moss-covered bucket, the iron-bound bucket that hung in the well" on the other. The latter served its generation, but this one wants more water and less moss.

Another way by which this interpretation is to be given, and it is always recognized as one of the very best of ways, is through the agency of the public school. In home economics that statement, "A little child shall lead them," has been verified many times. It is possible to give to the child in the school a conception of home life, a conception of the value of food, at the same time that you are teaching her to prepare food. It is possible to instill into her mind an idea of what the meaning of it all is and her part in it. It is possible to give her some idea about a standard of what good food is, and it seems to me that in the present crisis there are at least three things that every food lesson should do: It should teach the class of food to which this particular dish belongs, it should teach its relation in the home as to the meal in which it belongs, and it should do something toward teaching food values. That child should know at least three substitutes for that food, provided she cannot secure it. As to what the child can do, we have had a good illustration in Chicago recently in conservation, when a group of foreign women said they could not read the recipes they were given, and could not get the food they were in the habit of getting, but if they could have three or four recipes their children would translate them, and their children could show them how to prepare the dishes. I think we do not realize how much of civilizing, or how much

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of Americanizing, or whatever the word is, we do through these children of the foreign-born.

One of the things that home economics can teach is the meaning of that hated word "economy." There are people who say: "I have heard it all my life. I hope never to hear it again." But they forget that economy means simply wise expenditure, whether of money, energy, or what not. We never have had such a chance to practice wise expenditure as we are having and are to have. Unless we can really tell some of these people how to spend wisely their money for food, six months of bad spending will bring to us, particularly in cities, a lot of under-nourished people to be cared for. The thing that must be taught is wise use of food, wise substitutions of food.

Another thing that home economics has done and is doing is to bring into honorable repute the business of housekeeping. The girls who have graduated from our courses and who have gone into their own homes have found that it was entirely desirable and practicable to apply to their own homes the business methods that they learned in economics. They understand what it means to apportion time, to apportion food, to keep the balance of life and they are doing it. In the present crisis we are having more and more demand for the trained person who can discriminate between essentials and non-essentials, and those who can are those who are really going to be able to be helpful and not solely in lines of home economics. Indeed the phrase—home economics—includes very many things. The social worker, for instance, knows now that she must offer not only sympathy to the person to whom she goes but she may need to teach her how to mend her dress. The dietitian is having her turn, at least so far as enrollment is concerned. I was told at the Red Cross headquarters only yesterday that 800 are enrolled as dietitians. To be sure only about 50 are in actual practice, but that means this reserve force, and it seems as though out of it all we shall at least get a beginning for the dietitian.

A good many letters have come giving large and indefinite terms of need for a dietitian. Some considerable practice in reading them has enabled me to understand that what they really wanted was managing housekeepers; and, not knowing that in home economics housekeeping was an entirely reputable occupation, they have given it a large term. What they really wanted them to do when they got there was not to do something about the food, useful as that is; they wished them to direct the service and keep things going, with little opportunity to translate into terms of food and diet what they really should have been allowed to do. Out of it all I believe we are going to get a chance, at least, to establish some relationships, and not have the doctor diagnose the disease and somebody else who knows only enough to boil water prepare the food for the sick person. The dietitian's place will surely be found. In general, you will see that what I mean is that home economics is to interpret life, sometimes through the lesson of sanitation, sometimes through the lesson of personal hygiene, sometimes through the feeding of the child, whether it be the visiting nurse or the social worker or whatever the occupation may be.

Now, home economics has had a very large undertaking put upon it in these last few years. When we were beginning to be found out, and to be regarded as really a helpful part of the community, along came the Smith-Lever Act which, I believe, gave the first federal appropriation directly to the home—to the improvement of the home. This immediately

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gave a new definition for farm life, a new standard of judgment of farm life. We learned that it was no longer to be judged by its acres of corn nor by its flocks or its herds, but by the kind of life maintained in the farm home; and so the work of the county agent, man or woman, has been to interpret life, to get better recreation, to secure better sanitation, to teach people how to sleep and how to eat and how to work.

Work under the Smith-Lever Act was hardly started when the Food Survey Act was passed which just hastened the other process. And now we have the Smith-Hughes Act, and I shall be very grateful for any information I can get about its procedure. And finally, on top of all, there is the Food Administration. It really seems as though home economics had come into its own, when we have a food administrator and a home economics expert in each State.

How great is the task! And out of it all, the thing that it seems to me home economics is to do is to interpret. We must be very careful to speak the form of language that the people really understand. I have never had a more striking example of technical language used to conceal an idea than was given me by a woman who went to the hospital simply to be cured of a slight cold. In recounting her experience she said, "Well, they just kind of walked round and looked at me for a while, and then they said they were going 'to apply fomentations to my reflex areas.' I was not at all sure what was going to happen to me, but when they got at it, what they did was to soak my feet." We must not speak of diet to people who think that that means that we are going to take them to a hospital, or that we are not going to give them anything to eat at home. We must not speak of menus to people to whom it means a $4 meal when they have only 40 cents. I am wondering just how much work it will take to get into the minds of people the simple truth that there are five classes of food and three functions of food. The one great problem is to interpret in understandable language.

Home economics, in either peace or war, has a chance to teach something of the beauty of life and the unity of life, to teach that there is an art in a well ordered home and a well ordered life; and that perhaps is the greatest thing that home economics has to do.

THE PRESIDENT. The next speaker is Dean Catharine J. MacKay of the Iowa State College.

FOOD AND FOOD ADMINISTRATION

BY MISS CATHARINE J. MACKAY

It is my privilege to present to you a brief report of the food conservation campaign in the various States, in so far as it relates to the home and as it is carried on by the home economics departments and extension workers of the Land-Grant Colleges, in cooperation with the Federal Department of Agriculture, the Food Administration, and other cooperative agencies that work within the States.

The home economics worker within the State today occupies very much the position of the housewife or homemaker or mother in the family. The housewife has to deal with so many different individualities within the family that she becomes quite expert in establishing relations between its various members. The home economics worker at this time must take a similar position within the State.

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While there are slight differences in the plan of organization for development of the work within States, there is on the whole a similarity of organisation which results in the utilization of all available machinery for the extension of instruction in food conservation. In general, the organisation is based upon the following plan, which is essentially cooperative:

1. The State Food Administrator.
2. The State Council of Defence.
3. The Woman's Committee of the State Council of Defence with its various committees.
4. The Agricultural Extension Department of the Colleges of Agriculture and the Mechanic Arts.

The home economics departments, and the home economics extension departments of the colleges, have worked with these organizations to secure the most widespread results in the development of intelligent cooperation in the conservation of food within the homes of the country, and to promote an interest in and cooperation with the Food Administration and the Federal Department of Agriculture. Through this organization we have been able to secure the interest of all classes of people through many agencies in the community; for instance, the public schools, the colleges and universities, the parent-teachers' associations, women's clubs and various other organizations.

When war was declared and the need of greater food production and conservation was made known, an immediate adjustment of instruction in foods was made in the college classes, especially along the lines of production and conservation. Furthermore, special classes were organized with the purpose of preparing home economic students to be of service in their home communities on their return at the end of the spring session. Courses were given in the organization of extension classes, boys and girls' club work and canning clubs, with special training in the emergency work which was considered necessary at that time; for example, food conservation lessons, special dietary studies, foods which can be utilized from the natural products of the region, preparation of adequate menus, etc. Courses were provided in cooperation with the Agricultural Department, in horticulture, gardening, dairying, poultry raising, bee keeping, drying and storing roots and vegetables, and other subjects related to the production and conservation of foods. Special courses in conservation were provided in the summer session for teachers, housekeepers and others whose work consisted of securing and preparing food supplies for large or small household groups.

The agricultural colleges of the country sent out many young women, graduate and undergraduate, who were prepared to lead in their communities in the conservation and production of food. Later in the summer, the ten lessons sent out by the Food Administration were given to teachers and groups of other students. The research work in the colleges related to the utilization of foods in the different regions. For instance, in Minnesota, Wisconsin and elsewhere, work was done on the utilization of barley and other substitute products for flour.

Splendid work was done by the extension departments, both before and after the passage of the Food Administration Act. By means of demonstration trains at county and state fairs, instruction was given in the selection and buying of foods and food supplies. Where fair exhibits were made efforts were put forth to avoid the waste of the food which usually occurs at such places, thus giving a very important object lesson in

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food conservation. As a result, more carefully selected and smaller exhibits have been shown. Canning, drying and food preserving campaigns were organized early last summer, and resulted in the saving of an enormous amount of garden and orchard products. The campaigns for fruit drying were also carried out by the horticultural extension departments throughout the country. Many women needed to learn how to use the dried products, which our forefathers used, and it was necessary to demonstrate the methods of using them.

The girls' club work has been extended in all parts of the country and much interest has been exhibited in the public schools and elsewhere. This will have a wonderful effect upon the young women, teaching them not only food conservation but conservation in general.

Extension classes were conducted in the public schools and specific classes for industrial workers were organized in many cities. The extension worker has gone into the factories with instruction to the women along the lines of food utilization and preparation of foods for the family. Many factory workers not only support themselves but other members of their families, and they need to know how to spend their limited incomes to the best advantage in buying food materials.

Proprietors of bakeries, boarding houses, hotels, etc., were also met and conferences were held.

The extension workers quite generally carried the pledge cards with them which created an interest and secured many signatures.

Special bulletins on conservation, not only of food but of clothing, textiles and health were prepared and liberally distributed. Many extension departments used posters illustrating the need for saving food. The daily and weekly press and the magazines have been utilized for the publication of prepared material on food conservation. Not all of the material which has been issued has been prepared by competent authority. Some have not been the product of home economics workers.

Most extension departments have experienced difficulty in securing well trained workers. Emphasis, however, has been laid on adequate preparation for extension work, and in most States slow progress has been made in placing extension workers in the field on account of shortage of workers who were adequately trained. It is felt that we are now prepared for better work. Such opposition as has been encountered is dying down.

It is difficult to estimate in numerical terms the extent of the campaign. Cooperation has been extensive and the interest widespread and growing. The people understand more clearly the food needs of our own Nation and of its Allies. We are accustomed to an abundant food supply and it is often hard to convince the farming people of the need of economy in food consumption. Appeals to their patriotism will give the best returns.

The great need of the times has served to give to the home economics instructors throughout this country an "open sesame" into the homes of the people. They have an unprecedented opportunity for service. The need for food is great, but we must not overlook the need for conservation of other products. The war is taking away the young men, the best of our country's resources, and we must conserve to a greater degree than ever the lives of the children.

In view of the unprecedented demands this war is making upon the endurance of the people, great effort must be made to cooperate with every force at work to maintain the standards of living within the home, to pre-

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serve the health of the people, to conserve the foods, textiles and other supplies needed in the prosecution of the war, and to promote the social, religious and national life. To this program the home economics workers of this country are dedicated, and for these purposes they are ready to cooperate with other agencies in developing knowledge regarding the best welfare of our homes.

THE PRESIDENT. The next speaker is President C. R. Van Hise of the University of Wisconsin.

GOVERNMENTAL REGULATION DURING THE WORLD WAR

BY C. R. VAN HISE

The program, as I looked at it, seemed to provide for covering somewhat fully, probably adequately, the question of food conservation and the question of readjustment of food programs, and therefore I have thought of considering the general question of conservation and regulation.

CONSERVATION BEFORE THE WAR

Some of us have forgotten, perhaps, that conservation and regulation are not new questions in this country. They have been before us for more than 25 years. When a youth, I used occasionally to lecture upon the conservation of the mineral resources and to point out that it took the building of the world to make these resources, that they could not be added to by any human being, and that when they were exhausted they were gone forever; but nobody would listen to me.

Later, however, when Theodore Roosevelt was President, the question of conservation was taken up by him. Almost immediately, as the result of the dramatic bringing together of the governors of the States for the consideration of our natural resources from all points of view, it was appreciated that there would be a shortage of some in the not distant future. At once conservation was adopted by all political parties and was accepted as a national policy. However, while that conservation movement persisted for a number of years, and there were conservation commissions organized in most of the States and a vast amount of work was accomplished which I cannot attempt to cover this afternoon, interest in the subject had somewhat waned before the war; at least, the subject was less talked about.

REGULATION BEFORE THE WAR

Just as there has been a conservation movement which has been a continuous growth, there has been a regulation movement which has gone back for a long time. It is known to most of you that when it was pointed out some 25 years ago or thereabouts that the public utilities are a special form of property which made them properly subject to regulation, the doctrine was denounced as socialistic. It required a long, hard fight to establish the principles that public utilities are subject to government regulations. That, to the younger of you men and women, seems an axiom of political economy, but the older ones here will remember the struggle required to establish it.

Still more recently, the question came up of the regulation of foods and drugs. We used to rely upon competition to secure quality. It was

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the theory that the house that sold only pure drugs and wholesome foods would be the one that would succeed; and yet we used to buy, as pure honey, that which was wholly innocent of having had anything to do with a bee, and boneless chicken which I will not attempt to describe.

Again, when it was proposed that the label should correspond with the product, the idea was denounced as being quite subversive of the principles of unrestrained trade. You will remember the fury of the struggle before Congress before it was settled, that a commodity, so far as foods and drugs are concerned at least, must not be falsely branded.

These two regulatory movements to a certain extent are in opposition to the principle of control by law of supply and demand and competition. Their adoption was accomplished only after a long and severe struggle.

SHORTAGE OF COMMODITIES AND RISING PRICES

The United States has heretofore produced more than we needed of almost every fundamental product. Of course, we knew that sometimes in China, Japan and India, the people were hungry, but it never occurred to us that in the United States it would be necessary for us carefully to conserve food.

Just as we could produce a surplus of food, so before the war we were able to produce steel in excess of the home demand; indeed we were able to produce almost every really fundamental commodity, with the exception of sugar, in quantities greater than necessary to meet our own needs. Of course there were imported tea, coffee, etc., commonly considered essential; and also luxuries in great quantities.

Then there came on this world war. Thirty millions of men in Europe were taken out of productive industry and put into war vocations. Within a year after the war began it appeared that there was going to be extraordinary demand for our products, both raw and manufactured. Under these circumstances we were unable to produce as much as was required to meet our home demands and those of the markets abroad. Furthermore, after we became involved as partners with the Allies, it became just as much our duty to provide them with the essentials to carry on the war, including food, as it was to provide ourselves.

Under these circumstances prices went skyward—doubled, trebled, quadrupled, for many commodities. There is no definite relation between the excess demand and the increase in prices. For no commodity, as nearly as I can ascertain, is the excess demand greater than 40 percent. For coal, a commodity in which the shortage is acute, an increase of 20 percent over last year beyond our normal production would meet all needs at home and abroad. Yet, notwithstanding these facts, prices have gone up two, three or fourfold. Therefore, under control by the law of supply and demand, it has been demonstrated that there is no definite ratio between excess demand and the amount that the price may be increased. The prices of foods are advanced; the employees must have higher pay because of the increase cost of food; the raw materials for manufactured articles are advanced; the manufacturer charges a higher price for his articles because he must pay more for his labor and an increased price for his raw materials. The jobber and the retailer did likewise. At each successive stage the advance of prices is made sufficient to cover the increased cost and an additional increment is placed on top. The cycle thus completed is begun

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again with food; and the circle once more is gone around. The second cycle completed, the conditions are right for a third cycle; and so on indefinitely, with the result that prices rose beyond all reason, like a spiral ascending to the sky.

REGULATORY MEASURES NECESSARY

To remedy the situation the President asked Congress for one regulatory measure after another. The crisis was such that these requests have all been met. The result is a most amazing series of regulatory enactments. These are as follows:—The Food and Fuel Administration Act, the Shipping Act, the Espionage Act, the Trading-with-the-Enemy Act, and the Priority Act. And the War Industries Board and the Federal Court have instituted regulatory measures without congressional action.

It is my purpose very briefly and inadequately to summarize some of the things which have been done under these regulatory measures and, following such summary, to discuss the principles involved. All of the measures enacted by Congress grant the powers to the President. These he has in some cases at first exercised, but later delegated them to agencies created as authorized by the acts. After such agents have been created, the President has issued proclamations from time to time in accordance with the recommendations of the several agencies. In the succeeding pages, for the sake of brevity, no discrimination is made between the exercise of the powers by the President directly and their exercise by his agents.

THE FOOD ADMINISTRATION ACT

Under the Food Administration Act, the President appointed Herbert Hoover, Food Administrator. The latter organized the food administration. A licensing system has been introduced for all essential commodities. Manufacturers, wholesalers and other distributors are required to take out a license in order to conduct their business. Under the terms of these licenses, hoarding and speculation are to be eliminated and only fair and reasonable profits or charges are to be made for services rendered. Thus the charge which the miller may make for the manufacture of flour and the margin which the jobber may take for its distribution are definitely limited.

The law confines the control of the Food Adminstration to the zone between the original producers, that is, the farmers and the farmers' associations and the retailers with a business less than $100,000 per annum. The manufacturers and the wholesalers are directly reached by regulation; the farmers and retailers only indirectly. While the base price of the producer is not controlled, intermediate additions are, so that the product reaches the retailers with only a fair increment added to the price of the producer. The public is informed in regard to the price which the retailer pays and what would be a fair price which he should charge.

Scarcely less important than the regulation of prices is the control of distribution. The Food Administration decides upon the amount of the essential commodities which go abroad and to what country they are to go. Not only so, but he controls the home distribution, and, if advisable, even to the extent of the purposes for which the commodities are used and the amount.

As a result of the work of the Food Administration, the skyward movement of prices has been checked, and for some of the most essential

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commodities such as wheat, the product of wheat flour and bread, there have been reductions in price. Furthermore, prices have been stabilized. Dealing in futures for the most essential products has been prohibited and hoarding and speculation prevented.

THE FUEL ADMINISTRATION LAW

One section of the food administration act authorized the control of fuel. Under this section the President appointed H. A. Garfield, Fuel Administrator. The maximum price of each kind of coal and coke at its source has been fixed. Moreover, the margins which are allowed to the jobbers and to the retailers have been limited, and thus the price of coal to the consumer has been controlled. Therefore for coal, the price control occupies the full field rather than the zone between the producer and the retailer as in the case of wheat.

The Fuel Administration has also controlled wage contracts with the miners. When a considerable advance of wages was approved, it was made a part of the contract that the miners should be penalized $1 a day if they declined to work or ceased to work during the time the contracts into which they had entered remained in force.

The distribution of coal and coke has been controlled as completely as the price. The coal has gone for the purposes and to the various districts in accordance with the decisions of the Fuel Administration. The amount of coal which goes abroad is also controlled. Thus the amount assigned to Canada is the quantity received last year plus the same percentage of increase as that obtained by the United States.

Had the Fuel Administration so decided, it would have been possible under the law for the Government to become the exclusive buyer and seller of the coal for the country. Had this method been used, the coal mined would have been sold to the Fuel Administrator by the operator at a fair profit. The coal then his property would have been pooled and sold at prices dependent upon its value taking into account its thermal power and other qualities and its position in the country in regard to the freight. The prices fixed would have been sufficient to cover its cost including that of administration.

THE SHIPPING BOARD AND EMERGENCY FLEET CORPORATION BOARDS

The United States Shipping Board has requisitioned all cargo ships and tankers registered under the laws of the United States of not less than 2,500 tons total dead weight capacity, and all passenger steamers of not less than 2,500 tons gross register. These vessels, thus requisitioned, have in general been leased to the companies which before have been operating them, the companies receiving a definite compensation based, for freight boats upon dead weight ton capacity, and for passenger vessels upon the number of passengers which they can carry. The vessels are to sail on the routes and carry goods as determined by the Shipping Board.

The Shipping Board also exercises the control of interstate commerce by water, its powers being analogous for water transportation to those which have been exercised by the Interstate Commerce Commission in regard to railroads. However, the powers of the Shipping Board extend beyond those of the Interstate Commerce Commission in that the Board is allowed to approve any agreement between common carriers by water con-

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cerning rates, accommodations, pooling, limited sailings, and other arrangements; and all agreements thus approved by the Board are exempt from the Sherman antitrust law and its amendments.

Under the Shipping Board, there has been organized the Emergency Fleet Corporation with a capital stock of $50,000,000. This corporation has requisitioned all the shipyards of the United States and all the ships under construction. The ships will be completed in accordance with the directions of the Fleet Corporation. The actual operation of the yards and the finishing of the ships remain with the corporations and persons who previously had them in charge, but the compensation which they are to receive is upon the basis of a fair profit, which is decided by the Fleet Corporation.

The Fleet Corporation is also engaged on a gigantic scale in the construction of additional ship building plants and in the construction of new ships. This work is largely done not by the Fleet Corporation itself, but under contract. The Emergency Fleet Corporation has announced that the actual building program under contract embraces more than 8,000,000 tons, dead weight capacity.

THE ESPIONAGE ACT AND THE TRADING-WITH-THE-ENEMY ACT

Under the Espionage Act and the Trading-with-the-Enemy Act all exports and imports are placed under the control of the President with authority to delegate his power. The control of exports was first exercised by the Exports Council, later by the Exports Administrative Board. This power still later passed to the War Trade Board, and there was added the control of imports. Others have been issued so that at the present time the exportation and importation of all commodities of importance are completely controlled. The exportation of some is altogether prohibited and others prohibited except to our Associates in war. Imports are likewise controlled in an appropriate fashion. Trade is altogether prohibited with the enemy or ally of the enemy and with some 1,600 firms in neutral countries.

These regulations are exercised through licenses; and there is absolutely no exportation or importation of goods except by those who have licenses approving the particular transactions.

THE PRIORITY ADMINISTRATION ACT*

The Priority Administration is organized under the Priority Act. This enactment compels the railroads of the United States to handle all the transportation business of the country as the President directs. Under the Act the President appointed Judge Robert S. Lovett, Priority Administrator. In his work the Administrator has had the cooperation of the carriers, of the Interstate Commerce Commission, and of the other special war administrations.

The Priority Administration has given a number of special orders for preference in shipment, and finally has issued a general priority order, which indicates the precise preference in handling the commodities which are necessary directly to carry on the war or indirectly to support the carrying on of the war, such as food, feed and fuel. In short, the railroads

*The statement made under this heading was correct at the time the address was given (November, 1917). The entire situation has been changed by the government's taking over the railroads.

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must first provide for all of these needs in the order prescribed, ranging from steam railroad fuel through foods, to fuel necessary for domestic purposes, the public utilities, and for essential manufactories, etc. Only after these needs of transportation as provided for can the railroads handle other business.

In obeying the directions of the Priority Administration, the railroads are, by the terms of the Priority Act, freed from the penalties of the Sherman and other antitrust laws.

THE WAR INDUSTRIES BOARD

The War Industries Board is a creation of the Council of National Defense. At the request of this board the producers agreed to maximum prices for copper and for the more important forms of iron and steel. The prices fixed are the same throughout the country, except such allowances as are made for differentials due to freight, etc. Since the demand exceeds the supply, the maximum prices is the price which obtains. Therefore producers of copper, iron and steel sell at definite prices without regard to who is the purchaser. Competition in prices is completely eliminated.

These agreements have been approved by the President. They have, therefore, the sanction of the law so far as the purchases of the Government are concerned, since Section 120 of the National Defense Act authorizes the President to fix the price of all commodities for the Government necessary for the prosecution of the war. But agreement upon prices for copper, iron and steel paid by the public have no warrant in congressional action.

The prices are large reductions from those which obtained before the agreements were made, but are much higher and in many cases at least twice as high as those which prevailed in the pre-war period.

Also, by the request of the War Industries Board, the manufacturers have agreed to a definite order of preference. Under this priority agreement, first are to come war orders; second, those which are, while not directly for the war, of public interest and essential to the national welfare; and third, unessential commodities. Each manufacturer obtains permission to the War Industries Board to execute any order, and further executes its orders in accordance with the preference rules of the Board.

Thus the War Industries Board through request has secured not only the agreement of the manufacturers in regard to the prices of steel, iron and copper, but the preference in which the work is done. The steel and copper businesses are regulated to a large extent in the same manner as food and fuel are controlled in consequence of Congressional enactment.

REGULATION BY THE FEDERAL COURT

The Federal Trade Commission by the direction of Congress investigated the print paper business and reached the conclusion that the control of this industry should be taken over and operated by the Government during the war, and so recommended. Action by Congress upon this recommendation is pending.

In the meantime the Attorney General brought suit against the News Print Manufacturers Association under the anti-trust laws. The suit was not contested and the court issued a comprehensive order that the Manufacturers' Association should be dissolved. The association and a number

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of its officers were fined. At the same time this was done, the court entered into an agreement with each of the firms making up the association, some 40 in number, in regard to the maximum prices which should be paid for the different kinds of print paper for a period of three months, and after that term delegated the same authority to the Federal Trade Commission to the end of the war and three months thereafter.

All the members of the dissolved association entered into a contract with the court to execute this agreement. The manufacturers agreed with the court in the fixing of maximum prices throughout the country. Since, however, the demand is in excess of the supply, these maximum prices are in fact the prices everywhere paid.

Thus by court action, without any change of the law, the same results are reached for the control of prices of paper as are reached by the Food and Fuel Administrations concerning food and coal in consequence of the law and by the War Industries Board for the control of prices of copper, iron and steel. The reason given by the court for the exercise of this authority was, that in the present condition of affairs in the United States, it was desirable that some adjustment of the controversy be made.

REGULATORY MEASURES AND THE ANTITRUST LAWS

The facts presented show that for food, fuel, copper, iron, steel, paper, and transportation by land and water, the principles embodied in the Sherman and other antitrust laws are directly contravened.

The fundamental ideas of the Sherman Act are that trade is controlled by the law of supply and demand and that in manufacture and transportation all are on an equal footing. Commodities are freely to flow as required by competition. If there is a shortage, the highest bidder will have his necessary needs met. There must be no cooperation in distribution. The common carriers must show no discrimination in goods. If there is cross freight, this is immaterial. The carrier must ship the goods as asked by the shipper.

Everyone of these principles is directly violated under the control exercised through the war measures. Prices instead of being variable are the same for the same commodity at the same locality. For wheat the price is to be neither higher nor lower than that fixed by the Food Administration. For fuel, copper, iron and steel, only maximum prices are fixed; but since the demand exceeds the supply, the maximum prices are those in fact everywhere paid. The difference in prices for a commodity at different localities is only that necessary to compensate for freight differentials and other conditions.

In the matter of distribution, commodities do not go to the highest bidders but to the persons and places indicated by the control. The wheat and sugar remain at home and are sent abroad in proportions decided by the Food Administration. Fuel is furnished to the Government and to corporations and individuals as decided by the Fuel Administration. Copper, iron and steel are first to go directly to war purposes, then to purposes which are indirectly to assist in the war, and only what is left may go to unessential industries.

If the prosecution of the war is best furthered by so doing, commodities are sent abroad. If to do this it is necessary to curtail the home consumption, this is done. The control of exports and imports through licenses is completely in charge of the War Trade Board. The common

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carriers instead of handling goods without discrimination must handle them in such a manner as to avoid cross freights and in the order which the priority board indicates.

In short, there is governmental control of many phases of industry and commerce for a number of the most essential commodities.

By express act, any form of cooperation in shipping which meets the approval of the Shipping Board, even to the extent of pooling, is exempted from the antitrust laws. The same is true for the railroads acting in accordance with orders of the Priority Administration. No such express exemption is made for the agreements in regard to food and fuel. It is to be presumed that for these commodities the enactments of the food and fuel laws by Congress may be construed as repealing the antitrust acts so far as the particular authority of these laws goes. Thus the fixing of the price of wheat and the control of wheat as a government monopoly are authorized by law enacted later than the Sherman and other antitrust acts; and they, therefore, in effect repeal these laws as far as these transactions are concerned.

However, for the transactions of the War Industries Board, there is no express law authorizing the copper, iron and steel men to agree upon prices and to recognize priority. This board makes requests rather than issues orders. The price fixing is by agreement. These agreements may have the sanction of law by implication, so far as the purchases are by the Government under Section 120 of the National Defense Act. But it is clear that in agreeing upon prices for the public, the copper, iron and steel men are violating the anti-trust laws; and they are so doing by request of the War Industries Board, an instrument of the National Council of Defense, and with the approval of the President.

INCONGRUITY OF THE REGULATORY MEASURES AND THE ANTITRUST ACTS

At the very same time these agreements are being made and are in force, the United States Steel Corporation is before the United States Supreme Court, charged with violating the antitrust laws by cooperation in controlling prices. Even if the charges are fully sustained, they do not go so far as the cooperation of the copper, iron and steel men in response to the request of the government. Is this not indeed an extraordinary anomaly?

If the Steel Corporation is dissolved by the Supreme Court in consequence of the prosecution of the Attorney General, this dissolution will be caused by actions less in violation of the law than those which the Steel Corporation has subsequently done at the request of the War Industries Board.

But the most curious anomaly of all is that in regard to book paper. The manufacturers of book paper are indicted for price fixing. The organization under indictment is dissolved and several of its members are fined. The court itself then enters into a contract with these same manufacturers to fix for three months the maximum price for print paper at somewhat lower rates than those fixed by the combination itself. The contract grants authority to the Federal Trade Commission to continue maximum price fixing throughout the war and three months thereafter.

REGULATORY MEASURES BENEFICIAL

Few I suppose will question that the regulatory measures authorized

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by law and those taken, without such authority, have been not only a benefit to the people but essential for the successful prosecution of the war. They have resulted in checking the enhancement of prices for essential commodities which, before these regulatory measures were enforced, were sailing skyward. Not only have rising prices been checked, but for many of the commodities they have been reduced—for food, fuel and paper, moderately; and for copper, iron and steel, largely. Also great economies have resulted from dividing orders among the different plants in such a manner that each does the work for which it is best fitted and nearest the location at which the commodity will be used. Vast additional economies have come from operating the carriers in such a manner as to reduce cross freights and thus lessen congestion.

The diversion of the wheat for export to the South instead of through the congested centers of the North and the East at a time when the transportational facilities of the country are taxed to the utmost is a vast economic gain. Also the diversion of the coal to the upper lake ports in advance of the closing of navigation has prevented great hardships which otherwise would have beeen inevitable.

Thus the majority of people will agree that the authorized exemptions from the antitrust laws, the exemptions from these laws by implication, the ignoring of them by the War Industries Board, and the action of the Court in enforcing them against the manufacturers and itself violating them, have all been beneficial.

RECONCILIATION OF ANOMALIES

But the question arises whether all of these anomalies can be reconciled. The answer is yes. Amend the first section of the Sherman Antitrust Act, which forbids restraint of trade through combination and contract or by monopoly, by adding the clauses, "The restraint of trade meant by this act is that restraint of trade which is detrimental to the public welfare; and the presumption is that any restraint of trade is thus detrimental and to become legal must be approved by an appropriate governmental agency." Without special exceptions, if this amendment were made, it would legalize the cooperation of shipping, the cooperation of the railroads and the actions of the Fuel and Food Administrations, the War Industries Board, and the Federal Court.

The facts presented show that cooperation by combination, contract or monopoly may be beneficial or detrimental. Too frequently, when the control of the market and monopoly have been in private hands without regulation, it has been detrimental; indeed so detrimental that this led to the enactment of the antitrust laws. When the control of the market or monopoly is, however subject to governmental regulation, it may be highly beneficial; not only beneficial, but at a time of war, absolutely essential. The sanction, as far as public opinion is concerned, of all of the regulatory measures in regard to ships, railroads, food, fuel, copper, iron, steel and paper, is that they have been a benefit to the people and have been essential for the successful prosecution of the war. There would have been no question about the legality and propriety of these acts, had the Sherman Act been amended in accordance with the suggestion made.

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THE CONTINUATION OF REGULATION AFTER THE WAR

All the regulatory measures considered are for the duration of the war or for a limited period thereafter. If no action is taken by Congress they will expire at ranging intervals following the conclusion of peace.

FUTURE REGULATION TO BE BASED UPON THE PUBLIC INTEREST

The regulatory laws discussed are all based upon the war powers of Congress. In each one of them it is declared that the act is necessary for the public security and defense. If they are to be continued after the war, it must be upon the basis that the matters with which they are affected with a public interest; that is, the regulation if continued must be on the same principle as that which applies to the public utilities. Many of the utilities have received special privileges involving franchises; but irrespective of this, it is well established that regulation may be applied to any business which is affected with a public interest. This goes back to the grain elevator case, in which this broad principle was definitely settled. Can anyone doubt that the business of an organization which controls half of the iron ore resources of the country, a large percentage of the coking coal, and manufactures half of the iron and steel of the Nation is affected with a public interest? Or that the same is true of dealing in the most fundamental food commodities, such as wheat, sugar, meats and fats? Therefore undoubtedly Congress has the power to continue the regulatory measures after the war. This then raises the question should they be allowed to expire or be continued. The obvious general answer is that so far as they will be beneficial to the public they should be continued, but so far as they will be detrimental they should terminate. The difficulty will be in indicating those measures which under normal conditions will be beneficial and those that will be detrimental. In considering their problem, there are certain general considerations which should have weight.

REGULATION NECESSARY TO MEET FOREIGN COMPETITION

It is certain that, following the war, combination abroad will be general. Already Germany is considering buying and selling nationally; and whether or not she decides to do this as a direct governmental activity, there is no question that the trading by Germany in any commodity will be done, if not through a single corporation, at least through such a limited number that they will perfectly cooperate in their production and distribution.

Furthermore, it is highly probable that this cooperation will be extended so as to include her allies. Under these circumstances it is certain that any attempt to meet Germany in world trade through the individualistic method under the law of supply and demand cannot have the highest success. If we do not meet Germany's competition by national organization as efficient as her own, we may as well at once concede that Germany will gain a predominant position for those industries for which she has adequate resources.

Already this has been appreciated by Congress; and there is now in conference the Webb bill which, if enacted, will permit cooperation in foreign trade. This bill proposes to remove the handicap in selling goods abroad; and this is in the right direction. It does not, however, permit cooperation in production within the United States; whereas such coopera-

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tion through cartels is legal in Germany. This powerful advantage Germany will retain. But if to meet this situation it be decided to permit cooperation within the United States, regulation is inevitable. If industry and commerce are freed from the restraints and penalties of the anti-trust laws, there must be governmental agencies that shall see that advantage is not taken of the public in consequence of this fact.

CONTINUANCE OF REGULATION TO MEET NEEDS OF ALLIES

There is still another aspect of the question of continuing regulation which requires consideration. For a considerable period after the war, the demand for food, and other essentials will be excessive. The cereal production of Great Britain, France and Italy has declined alarmingly during the war, because of lack of fertilizers and insufficient labor. Their herds are greatly depleted. These tendencies will continue throughout the war so that their agricultural production will become even smaller. It is probable that for a long time, possibly for several years, we may have an insufficient surplus even to meet the legitimate needs of our Associates in war; indeed it is little short of certain that this will be true for a number of commodities.

Shall we revert to the law of supply and demand under competition, and allow goods to be exported in unlimited quantities and without preference?

I do not know the answer others will make; but, for myself, it seems clear that the necessities of the Allies must be met not only during the war, but for a sufficient period after the war so that their agriculture and industries may be rehabilitated; especially as such rehabilitation in Belgium, northern France and Serbia is largely necessary because of ruthless and unnecessary destruction of property on a vast scale by the Central Powers and because of heavy drafts upon their financial resources wholly unwarranted by international law.

If the country accepts the answer suggested, it will require at the least that exports be controlled. Also if I am correct in believing that the demands for essential commodities after the close of the war will exceed the supply, the control of prices must continue, otherwise there will be another period of runaway prices; and with the present base from which it would start, this is not to be considered.

CONTINUANCE OF REGULATION WILL AVOID GOVERNMENT OWNERSHIP

No thoughtful man can doubt, whether or not he believes in the extension of regulation, that great economic changes are inevitable following the war. The growth of the socialistic group, heretofore mainly confined to other countries, will expand in the United States. Experiments on a gigantic scale of public control and even public operation of manufacture and commerce have been made in European countries engaged in the war and of less magnitude in the United States. Also it has been demonstrated that in many directions, under the system of cooperation, efficiency and economy have been very greatly increased and unnecessary wastes reduced. With the mighty burden of the war debts upon us it will be absolutely necessary to continue this efficiency and economy. Therefore in advocating the continuance of the use of the principle of regulation for those fundamental commodities essential to the very life of the people or in the legal

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phrase vested with a public interest, I believe I am advocating the policy by which we may escape government ownership and operation.

For my part I am very reluctant to see the management of the industries of the country fall into the hands of a government bureaucracy. The emergency situation, due to our unpreparedness, when we entered the war, was met in large measure by the voluntary service to the government of thousands of our ablest men from business and many other walks of life. Under the extraordinary stress of the Nation, incited by highly patriotic motives, they have left their private affairs and have taken positions wherever the country called. Their service is unbought. They are exerting their utmost energy for our country, and this will continue during the period of the war. But when the war ends, they will rightly return to their own affairs. They will not become a permanent part of government bureaus.

Heretofore, agriculture, industry and commerce have been under the leadership of able men who have reached their positions as a result of the competition of ability. The citadel of defense of private property is that the system develop initiative and energy. These qualities give large rewards to the men possessing them. The central point at which private property is attacked is that strong men use their powers for their own ends. The captains of industry have too often exercised their control without sufficient regard to the public interest.

What I am proposing is that property remain in private hands and that exceptional initiative and energy have exceptional reward, but that so far as business and industry are vested with a public interest they be subjected to regulation. Under this plan, those who controlled vast properties would necessarily exercise that control with due consideration for the masses of the people.

We then should have both the advantages of private property and the protection of the public. Should not this plan, both for the utilities and the essential commodities vested with a public interest be thoroughly tried out before we place the control of productive industry and commerce in the hands of governmental bureaucracies?

THE EXTENT TO WHICH REGULATION SHOULD BE CONTINUED

In advocating the continuance of regulation after the war, I do not mean to imply that all the existing measures should be retained in their present forms. It is yet too early to suggest a program in regard to the extent which this should be done. What I am advocating is that we maintain the principle that the essential commodities are subject to control in the public interest precisely as are the utilities. That principle recognized, regulatory measures should be continued only as far as necessary to meet the existing world conditions. In the further development of the policy of regulation we should proceed cautiously as occasion arises, precisely as we did in the control of the public utilities.

CONCLUDING STATEMENT

This World War probably will cost hundreds of thousands, and it may cost millions, of our men. It will require many billions of our treasure. This will put a heavy burden upon succeeding generations. The dreadful costs of the war we must bear. Should we not therefore gain everything

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possible from the experiences of the war? The vast savings due to more scientific production and distribution, if continued after the war, will in large measure, indeed they may completely, carry not only the interest load imposed upon us, but even furnish a certain amount each year toward the liquidation of the principal. Without being able to demonstrate it, I believe it probable, that if, following the war, wise governmental regulation is continued for essential commodities as well as the utilities, the savings of the people may be sufficient to meet the money cost of the war. Nothing but the establishment of the principles for which we are fighting can compensate for the losses in men.

THE PRESIDENT. One speaker after another has referred to the fact that this war has brought problems to us, the size of which we are just beginning to realize. There are men on this floor from a country that has been dealing with such problems for more than three years. One of these men has been with us many times in the past in our conventions. He is our neighbor, our old friend and now is our ally. I take pleasure in calling upon President G. C. Creelman of the Ontario Agricultural College.

CANADA'S PART IN THE WAR

BY G. C. CREELMAN

I esteem it a very high privilege when I am permitted, at any season of the year, to visit any of these United States of America. But in the month of November, when the time comes for the annual Convention of this Association, I feel that I have a special call. The wind would have to blow very strongly in another direction to prevent my being with you in your deliberations.

I met your President early in the week and he asked me then to make preparation in case an opportunity arose during the convention to say something in regard to Canada's part in the war. I am very glad to give you just an outline of what we are doing; not boasting, at all, but feeling that out of three years' experience we may have cleared up some things that may help you to hasten matters to an early conclusion.

Canada's part in the war it should be first understood has been entirely voluntary. Canada is no vassal state. If the idea still prevails in any quarter that the overseas dominions of the British Empire are still governed from Downing Street, that idea should be quickly dispelled. Conditions have changed greatly since that important incident took place in Boston Harbor nearly 150 years ago. Perhaps that incident has had something to do with the change. However, anyone who today attempted to spill high priced tea in the water would be certain to get into trouble with the food controller. Times are changed, but when in those fateful days of August, 1914, the war clouds gathered, the Prime Minister of Canada immediately cabled and stated that if, unhappily, war proved inevitable, Canada might be counted upon to play her part in the defense of the principles involved.

Within a few weeks the Parliament of Canada, consisting of the duly elected representatives of the people, unanimously and solemnly endorsed the action of the Prime Minister, and so Canada took her place voluntarily, but spontaneously, resolved to take the part of a sturdy, red-blooded, young nation, and to play that part to the full extent of her resources in men, in munitions, in money and in food.

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THE CALL FOR MEN

The first call came for men. Within a few weeks that call was answered by a response from double the number desired. Within three months Canada, a peaceful country, busy in things most foreign to war, hating war, yet hating injustice more, had recruited, equipped, armed and trained 35,000 men and sent them overseas for the service of the cause. We were convinced that the war would be decided upon the Western front and that conviction still holds in spite of what may happen elsewhere. To the western front, therefore, the men of Canada went and ever since a steady stream of men-laden transports have gone across the Atlantic.

How these men acquitted themselves the whole world knows. The names of Langemarck, Festubert, Vimy Ridge and many others are not only important names in the progress of the war, but are emblazoned on the pages of Canadian history over which they shed a new significance and new lustre.

Altogether over 400,000 men were enlisted in Canada under the voluntary system. Remember we are a people of less than 8,000,000 population, one-third of which is not of British origin. Properly to understand what that means it might be pointed out that an army of 6,500,000 men in a country of the population of the United States would be equivalent to the army raised by Canada under the voluntary system.

While at the present time Canada is raising 100,000 men by means of the selective draft, which is going into effect this month, and while I believe in the selective draft and believe you on this side were wise in adopting it at the outset, at the same time it should be noted that 75 percent of those who will form the Canadian army responded voluntarily to the call of duty and thrust themselves in the path of the Prussian brute which sought to dominate the world. This with the large percentage of men raised by the voluntary system in Great Britain will constitute one of the noblest pages in the conflict. I am strong in the language which I am using, but if the audience permitted it or the mails would let it go through, my language would be stronger still. I once lived for ten years in the United States and at that time learned a very mixed vocabulary.

THE CALL FOR MUNITIONS

Concurrent with the call for men there came a call for munitions. Canada did not know anything about making shells or fuses or any of the other diabolical things which science has brought into play in modern warfare, but we quickly learned. It is amazing how quickly a peaceful people can become a warlike people under the spur of great injustice. Canada's factories were rapidly mobilized into munition factories and the men and women were employed in large numbers and at fairly remunerative prices to turn out the modern utensils of war. This may be mentioned not only by reason of its influence on the war itself, but also its importance in the industrial life of the country. It was not long before the amount of money expended in Canada on munitions aggregated a million dollars a day, and at the present time it is not far short of a million and a half a day.

THE CALL FOR MONEY

It is well known that the financial burden of the war has fallen most heavily on Great Britain, and it was not long before Canada realized that

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her part included possibilities of assistance in this respect. Before the war Canada was in the habit of borrowing large sums needed for her development from the money markets of Great Britain and occasionally from New York. A domestic loan in Canada was something unknown. Under the influence of war our Finance Minister, however, decided to attempt a domestic loan. He started off modestly with a request for $50,000,000. This was so quickly subscribed to double the amount asked for that the next time he called for $75,000,000 and this was also subscribed twice over. This week he is asking Canadian people for $150,000,000 and there is little doubt but that it will also be subscribed twice over. These figures may seem small to a country like this where you are accustomed to talk in billions, but remember again that we are a country of only 8,000,000 people.

Aside from the money in loans, millions have been contributed each year to the support of the Red Cross and other humanitarian and relief works which have been necessary to alleviate the suffering thrust upon mankind.

THE CALL FOR FOOD

Food I have deferred to the last, not because of its importance but because it is possibly the one phase of our activities in which this gathering may be particularly interested and may be prepared to listen to in more detail.

Always important, agriculture has been placed in a new light by the exigencies of the war. Even in normal times Great Britain imported practically half of her foodstuffs, and a great deal of this came from the countries which were shut off by the outbreak of hostilities. Under these circumstances she looked to her overseas dominions and particularly to this American continent to make up the deficiencies caused by the interruption of her regular trade. Canada with her vast areas, though sparsely settled, was in a position to render assistance of inestimable worth in seeing that the Motherland and her Allies should not suffer for want of food, and there has been carried on in our country ever since the fall of 1914 a vigorous effort to see that nothing that could be done should be lacking in this regard.

It was of course recognized that the farmers of Canada who possessed the land and the equipment and the skill would have to be mainly depended upon. Great schemes of government production, though suggested at the outset, were found impracticable. The first duty of government, therefore, was to lay before the people the needs of the situation, and in the winter of 1915 the Federal Government launched what was known as the Patriotism and Production Campaign. In this campaign both the platform and the press were utilized fully to give the widest publicity to the need and to the methods by which that need might be met.

It may be of interest to note that possibly for the first time the public press was utilized in that campaign through the advertising columns to set forth the facts. Daily, weekly and agricultural papers in all sections carried large advertisements giving the information, and the effect was so satisfactory that the plan has been now very generally adopted.

In 1915 it will be recalled that we had exceptionally favorable conditions. Weather, labor, enterprise all seemed to be working together and the result was the greatest crop which Canada has ever produced. To

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mention only one item—the wheat crop aggregated over 400,000,000 bushels, about double the crop of an ordinary year, being about 75 percent of the wheat crop of this great country last year. Other crops were in proportion.

Two things have resulted. More food has been produced and better than ever; and women in the town and men in the town and in the city, with sore hands and tired backs, have come to have some appreciation of some of the difficulties which the farmer has when he comes to raise a crop and put it on the market at less than cost. Many a beet and carrot and parsnip this year, if the time of the person producing it was taken into consideration, would very materially increase the cost of living. School boys and girls have been sent out in thousands to the farmers and have been the best help given the farmers in the year. The small boy and girl in Canada say, "If I was old enough just one hour, I would be with my brothers and my sisters in the hospitals and trenches. If I can not do that, how can I do my best?" From one end of Canada to the other that is the spirit. I have a son who has not had his clothes off in the last ten days, in the front trenches. I have a daughter in a hospital, who writes that she has chilblains on hands and feet. She writes that they had not one stick of wood or one bit of coal all last winter with which to heat that establishment, and that when they could not stand it any longer they put on their steel skates and went out in the open to warm themselves by skating. And yet that girl writes me that she is not going to stop, nor are her comrades, until their brothers march into Berlin.

We were not able, with the boys who were left at home and the old men and women, and all who had helped in the field, to increase the crop, and then the question came, how about tractors on the farms? I said, "Tractors are good things," and we bought 130 tractors of all the makes that there were and put them into the fields, without any fear of being criticised in the days to come for having thrown away money, but with the hope that we might increase the yield of wheat and pork and corn and beef, to meet the need three or four years hence, and they have done good work. They have done a wonderful work in Canada; and during the three years of war conditions, with less labor than in the years immediately preceding the war, 300,000 more acres have been cropped in the province of Ontario alone than in the three years immediately preceding the war.

THE FOOD CONTROLLER

In the discussion of Canada's part, particularly in regard to the food question, mention should be made of a new national institution—the Food Controller. We have one of the best of the species—Mr. Hanna. In Canada some of the papers are always asking why Mr. Hanna does not do the splendid things Mr. Hoover has been doing. On this side I notice that the papers are complaining that Mr. Hoover is not doing all the splendid things that Mr. Hanna is doing! The fact is that they are both working in the closest cooperation and the resources of this whole continent have practically been pooled with the great object of rendering the maximum of service to the cause.

One thing should not be forgotten, that service to the cause through the conservation of wheat, bacon and beef is the object of the Food Controller's job, and not primarily the control of prices. We are at present conducting in cooperation with the Food Controller a campaign for an in-

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creased number of hogs next year, which is the quickest and most effective way of realizing the needed supply of meats and fats.

In conclusion, this is the plain, unvarnished tale, imperfectly and incompletely told, of what Canada has been trying to do in this war. I give it with some pride, but with no boasting. Canada fully realizes that the best she can do is not too much to accomplish the purposes in view. Moreover, Canada's part is not finished yet. Canada is in the war to the end, and that end must come in the triumph of democracy and the principles for which democracy stands. We are not worrying over the fact that the war is 3,000 miles away and thereby deluding ourselves that it is none of our business. We are glad that the war is 3,000 miles way, and we thank God for the British Navy which has kept it 3,000 miles away from us and from you. We realize, however, that the issues are very vital and very near. We appreciate the heritage which has fallen to us in the northern half of this continent and we realize that to have the privilege of living under these conditions, enjoying the freedom for the pursuit of health, wealth and happiness which is the common privilege on this continent, is worth fighting for and worth dying for.

We rejoice in the fact that this great Commonwealth of American States is now with us in the fight. We would like to have had you sooner, but we are none the less glad that you are with us today. We appreciate the help in all the things we have been trying to do in the last three years, which I have endeavored briefly to mention and which you can do in so much greater measure. We also appreciate the fact that you are with us, because it makes possible that unity of the great Anglo-Saxon brotherhood not only in this continent but in the world, standing together and rejoicing in much the same ideals, having after all sprung largely from the same stock. There is a great deal that can be accomplished in making this world a better place in which to live. The first duty, however stern, is to dispose of Prussian autocracy which has challenged our right to live out our ideals, and after that it does not require much imagination to see the great purposes which we all together may accomplish in the years that are to come. For these reasons as a Canadian I am glad that Canada has had a part, however humble, in this great war.

THE PRESIDENT. A few weeks ago when I was tramping in the New England mountains our party came at night to a hut 5,000 feet above sea level and stopped there for supper. The young man in charge of the hut was a recent college graduate, of high patriotism. But he also had this situation; he had many people to feed, and he had to bring all the food on his back from the plains below. Naturally he was somewhat interested in the appetites of the people who stayed with him; and, as a suggestion, he had put a placard on the wall reading, "What would Hoover say?"

Seriously, I think that little question was very significant, because in it is embodied the thought of the American people concerning the legal powers of the Federal Food Administrator, and also their confidence in his integrity and in his ability. I have the pleasure of presenting to you the Federal Food Administrator, Hon. Herbert C. Hoover.

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Food and Food Administration

By H. C. Hoover

We have plastered the walls of the country with a short statement; a statement that "Food will win the war." We also have in our own minds a depressing reservation, and that reservation is that "Food may lose the the war." A short survey of the food situation the whole world today reveals an astonishing state of things; things we would not have conceived four years ago.

Today there is no nation in Europe that has not some form of food control. There is not in Europe a nation that has not placed its civil population on some form of rationing. That is, in itself, significant enough of the unparalleled situation of the world's food supply and distribution.

By mobilizing its entire population for war, Germany has plunged the world into a defense which also involves the entire activity of the population. In our Civil War the great bulk of our people pursued their normal pursuits without interruption and the productive powers of the Nation was but little curtailed; but a war has come upon us where the entire civil population must be mobilized for war, and where every activity, every producing unit, has been brought into play and where every item of necessity in life has been brought under control and into jeopardy through diversion of our productive units from food to defense. Germany today although reduced in food supply, after three years of blockade, is still surviving on an area less than that of the State of Texas and with a population 60 percent of our own. That has been accomplished because every man, woman and child has been mobilized to production and conservation of food.

Our Allies are engaged in mobilizing each and all of their people to the same end. Despite this there is a steady degeneration of the world's food supply and we ourselves, until we came into the war, cared nothing, did nothing to stem this tide.

Now that we have awakened to responsibility we find our problems many and complex. They have ramified not only the questions of production but they pervade all our questions of commerce and economics. Food control has come to have a much wider significance than mere food conservation; it has come to have a significance of complete control of distribution and in coordination with the Agricultural Departments of the world it has come to have a dominating voice in production. As the war goes on for a period of years, we shall see each year a degenerating condition of the world's food supply due to further diversion of our productive units and a constantly tightening of legal and administrative measures over consumption, distribution and production.

The Food Administration in the United States, taken in the broad sense of the word, is fortunate in having already in existence not only a wonderful Department of Agriculture, but a great number of agricultural institutions throughout the country. Upon those institutions rests the primary responsibility in regard to production. How important they are stands out vividly silhouetted when we examine the situation in Russia. Russia, with no agricultural institutions of importance, with no adequate direction to production, has been thrown into a series of revolutions through the failure to mobilize her food resources. Had Russia's enormous

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capacity of production been properly guided, she would have today some form of stable government.

The problem of production, while it is the primary responsibility of our agricultural institutions, is no less a responsibility of the Food Administration, because upon our attitude and upon our action rests to a very large degree the return that the farmer will receive for his labor and in that matter we have not only a deep responsibility but we have a duty, that we may, through our agencies, second the efforts of our agricultural institutions to the last atom that can be grown. Therefore, in all of our conception of the control of distribution, we have started with the premise that the producer must have such a return as will stimulate him to produce; that the saving to the consumer must be made not by cutting into the producer, but by the stabilization of commerce by cutting out the waste, the speculation, the extortionate profit, from the distribution. There is, however, a point in price where the producer can rightfully ask for no more. The producer himself has a duty to the entire community. He has no right to ask for more than a proper return from his endeavors. The moment that he transgresses that line, he is asking for a profit from this war, that he may benefit by this welter of blood and sacrifice into which we have been thrown.

We have been careful, we have sought the best advice that we could find, that we should draw the line at the point that gave to the producer a right and proper return, a stimulative return, but one that safeguarded not only the interests of our consumers, but also the interests of the consumer abroad, for whose tranquility we have also a responsibility. You will recollect that last August we assembled a commission to determine a fair price at which the Government would buy wheat. Our agricultural institutions, in one phase or another, were represented upon that commission, as well as the actual producer. The two elements comprised a majority of the commission. We placed before those gentlemen the responsibility of determining for the entire Nation the price that it should pay for its bread, and we asked of them that they should determine the price that would be fair to the producer, that would stimulate his efforts, that would bring him a proper reward and a proper return, but for them to consider that if the producer took too much he would defeat his own end through the resentment of the consumer. Those gentlemen arrived at a figure of $2.20 a bushel for wheat, which I think has been accepted by the entire country as just. That price today is working out at an advance to the producer of about 50 cents per bushel over and above his realization for the year 1916; and today I am happy to tell you that the price of cash and carry bread in ten American cities is six cents for the full one pound loaf. That compares with five cents in the pre-war period. The price of flour in bulk at mill door, is four dollars per barrel less than it was the day the Food Control Act was signed.

Today the farmer is receiving 109 percent more for his wheat than during the three-year pre-war average. The cash and carry baker is receiving one-sixth more for his bread. The farmer is receiving today 43 percent of the price of that loaf as against 16 percent that he received in the pre-war period. In other words, extortionate profits, speculation, unnecessary transportation, unnecessary movement of commodities in distribution, have now been completely eliminated in that trade. That is the net result to the American consumer.

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It falls upon us to develop methods more or less different from this, whereby the prices of many, or perhaps eventually all, of the prime commodities may become standardized. It is our hope that in such development we can secure the fundamental result of increased production, because when all is said and done the destiny of this war will rest upon the American farmer.

Beyond production, however, we must reduce consumption. Today, statistically, theoretically, we have already shipped the exportable balance of 1917 American wheat from the United States. Every grain that is exported from this day forward must be exported from the savings of the American people. Every year the production of Europe must diminish. The curtailment of shipping, the steady application of more men to war, the derangement of the supplies of fertilizers, the disruption of commerce, can mean but one thing and that is a steadily diminishing food supply. This year Europe may get through for its bread supply by a narrow margin and by having recourse to many and remote markets. It may get through by the savings that we may effect by our own economies. But next year, with the situation still further degenerated, we must be in such position that we shall not have exported our final balance on the first of December. If this war is to be continued, it can only be continued if the world's bread supply is maintained and the maintenance of that bread supply now depends, as it never depended before, upon our people and the efforts they make.

A remark made by our friend from Canada impressed me greatly. Twenty percent of the laboring population of Canada is today in the trenches or in the war shops. We have called out less than five percent of our working population to similar activities and yet we are told that our production next year will diminish because of the shortage in labor. The Canadian, with his sense of service and his patriotism, has been able to part with four times the labor from the farm that we have parted with and yet he has maintained and even increased his production of food supplies. It is a thought worth carrying to the American farmer that his situation, desperate as it may be for labor, is not irremediable, that it requires a sense of service and devotion to national interests such as he has never yet been inspired with.

It is our duty as intelligently as may be to reduce the consumption of foodstuffs in the Nation and lessen the amount of waste. This year our harvest is in. We know the contents of the world's larder. We may calculate now with fair accuracy and with nicety what the destiny of Europe may be. We can see our way clear; but we can only see it clear if we can secure from the American public, and by the American public I mean every man, woman and child, a devotion to the conservation of food. We should fill their ships with another 100,000,000 bushels of wheat. That 100,000,000 bushels is an extraction from the American food supply made possible only by the reduction in consumption of bread in the United States. We can only allow its export if we see a saving of that amount month by month. We believe the American people will do it. We believe it is impossible for us to say to the Allies, "Your ships must go back empty from the American shores." But, in allowing those exports, we are doing so on the confidence and in the anticipation that we shall succeed in saving waste, in conservation, in substitution, in all the other avenues that we

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have opened up to the American homes by which they may each and all give national service.

The problem in Europe is not one of breadstuffs alone. It is also a problem of meat. Year by year as the war has gone on and as shipping has diminished, they have been compelled to make increasing inroads into the capital in animals and year by year the production consequently becomes less and the imports must become greater. Last year we exported about 1,500,000,000 pounds of pork products. This year we should export 2,500,000,000 pounds; and yet we opened the year with a less number of hogs in the country than we had at this time last year. Our only hope of success in this service during the next six months is by a reduction in consumption.

We find on study that the American people consume nearly two and one-half time the fats that are necessary to maintain the public health. A direct reduction in the consumption of fats will do no harm; in fact, it is the only solution of the problem today. I will not go over masses of figures with you, but the gravity of the situation must be evident to you. Europe depends upon us month by month for food supplies and the prompt and regular dispatch of her ships is fundamental to the maintenance of her populations in war. They have undertaken every measure conceivable for the reduction of consumption. There is no waste or loss today in England or France. There is a penalty of imprisonment on the mere destruction of household bread. Yet, with all the reduction that they have been able to bring to bear, they still need to import 900,000,000 bushels of grain against a total export surplus from the United States of not over 500,000,000 bushels. Last year we shipped 400,000,000 bushels of grain. We entered that export year with 300,000,000 bushels of a carry-over. We wound up the export year with 100,000,000 bushels of a carry-over and yet only managed to supply 400,000,000 bushels. This year the minimum of over contribution is 500,000,000 bushels of grain and we must do it even if it comes at the cost of a certain amount of self-denial on the part of our own people. The conservation measures of Europe bear solely on the civil population. The soldier is engaged in a more strenuous and active task than in his normal life. His food consumption has increased by the war. There are 11,000,000 men among our Allies, under arms, and there are probably 10,000,000 more in strenuous endeavor in munitions work. There has been a material reduction in total allied consumption, for the Allies have reduced their imports from a normal of 1,200,000,000 bushels, and that reduction has come out of the women and children of England, France and Italy. Therefore, any failure on our part means added suffering to those whose devotion is already well taxed. It therefore becomes a question wider than war. It is a question of humanity itself; and it is that question of humanity that we must get to the American farmer, that every spade and every shovel of earth that he turns is a service today in the preservation of human life.

The conservation of food has many phases of no less importance. If we are to win this war we must pay for it out of the savings of our people. Wars are not paid for out of houses and railways; they are paid for by the daily saving of the people during the progress of the war. We must, therefore, reduce our necessary expenditure in order that we may increase our saving. If we may reduce our food consumption by a matter of six cents a day per person, we will have saved $2,000,000,000 per annum. We

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will have added one-fifth of the resources necessary to carry this Nation in the war and we will be able to have emerged from the war with an economic damage lessened to just that extent.

Conservation has still other phases. We have a problem in this country of instilling the people with the sense of service, of awakening a sense of self-denial, of willingness and devotion and to sacrifice to the national interest. Fifty years of unrestrained, unrestricted individualism has driven the population far from a sense of national service. Through the food savings we hope and we believe we have attached to every household and every home a service and definite contribution to the national cause. We believe that it is itself an inspiration and a contribution to the war and that it will constitute a compensation for the losses of war. All war is losing game. Into this war we have been forced in self-defense. We must lose vastly in life and property. We willingly do so to secure our national preservation. That is our first gain, but it will be at an enormous cost. We could turn this war, however, from a loss to a profit if we could turn the minds of our people towards self-denial, towards devotion, towards a willingness of sacrifice to national service. All of these measures that we ask in service from the American people, of increased production from the farmer as a national contribution, of decreased consumption from the consumer, of abandonment of undue profit by the distributer, are inspirations towards national ideal. This is the type of service that you can place before your people. You can convey these inspirations more forcibly to the American farmer than any other body of men in the United States. That is the service that we in Washington ask today.

On motion, a recess was taken until 9 A. M., Friday, November 16.

Morning Session, Friday, November 16, 1917

The Convention was called to order at 9 A. M. by the President.

The President. The report of the committee on extension organization and policy will be presented by its chairman, Director C. W. Pugsley of the University of Nebraska.

Report of the Committee on Extension Organization and Policy

Copies of the report as the committee referred it to the section at its round-table discussion Thursday evening are available in mimeograph form. We were considering, among other matters, that of a code of professional courtesy. A member remarked that professional courtesy was never democratic but autocratic. On motion, a paragraph dealing with this matter was stricken from the report. Furthermore, the paragraph referring to the instruction of home demonstration agents by the men county agents, in so far as demonstration matters in the county were concerned, met with opposition. It developed that the extension directors were not ready to make a definite recommendation touching this matter and consequently this paragraph also was elided. Otherwise the report was changed but slightly. Those who may hold these mimeographed copies should remember that they do not represent the report as finally adopted by the committee.

In accordance with custom, your extension committee sent a circular letter to the extension directors asking for suggestions concerning prob-

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lems which it should consider. A hearty response was received. The brief extension report submitted herewith deals with such of those problems as the committee felt came within its jurisdiction.

Our first duty. The spirit of the Smith-Lever Act has guided us in the development of extension work on a sound and systematic educational basis. The organizations in our several States will hold to their purely educational projects as closely as possible, but in these times of national peril they welcome opportunity to render patriotic service of an emergency character.

Emergency work. The administration of emergency extension work under the terms of the general "Memorandum of Understanding" which places all of the extension work carried on by the United States Department of Agriculture in the hands of the extension services of the various colleges, brings to each State added duties. Our working forces have been very materially increased and we are confronted by the problem of the best way in which to handle the emergency work in its relation to the regular work.

We believe that emergency work should be organized and directed in the same manner as regular work, keeping always in mind the important and immediate objects to be attained. We should be very careful in its development to keep the regular work on a sound basis and also to leave the field at the close of the emergency period in such a state that regular work can be established as rapidly as conditions warrant.

States Relations Service. In last year's report your committee urged the importance of taking up all matters of relationship with the United States Department of Agriculture through the States Relations Service. The greatly increased obligations brought about by the Food Production Act have emphasized the wisdom of this method of procedure.

The direction of the work by the colleges in accordance with the general memorandum of understanding and the agreement made at the Amherst conference can only be maintained by taking up all matters directly with the States Relations Service rather than with offices or bureau of the Department. Such cases of difficulty as have arisen have come about largely because of a disregard of this method of procedure.

Surveys. The emergency situation is sure to develop a considerable demand for the collection of statistical data in the form of surveys, etc. The county agent is sometimes thought to be the most suitable medium through which such data could be compiled. Your committee regards it as expedient to impose only such additional duties on a county agent as may be clearly shown to be vital to the emergency.

Junior work. Technical instruction in boys' and girls' club work should be consistent with the teaching of college departments having the subject-matter in charge.

Executive Committee. Several questions were raised by the extension directors which were referred by your committee to the Executive Committee in accordance with the paragraph in last year's report (page 139) which directed such disposition of matters of extreme importance. In the presentation of these questions your committee attempted to make clear its opinion as to the advisable procedure, realising at the same time that due consideration must be given to other important phases of the question as they relate to college work in general.

Smith-Hughes work. The entire matter of the new Smith-Hughes Act is one which is of interest to all departments of the college. The exten-

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sion service is especially interested in the administration of this Act in so far as it relates to the home project work in agriculture and home economics as now carried on by the extension divisions under the name of "boys' and girls' club work," and also to the work with adults, which may be undertaken by Smith-Hughes agricultural and home economics teachers in their respective communities. This feature of the work was called especially to the attention of the Executive Committee.

Food Administration. The statement made by the Secretary of Agriculture in his address before this Association (page —) to the effect that the Secretary of Agriculture and the United States Food Administration agree that all work related to agricultural production should be relegated to the United States Department of Agriculture, affords a very satisfactory solution to this problem. Your committee called the attention of the Executive Committee, however, to the fact that the statement did not cover the work ordinarily carried on by our home economics workers.

Overhead expenses from emergency funds. The extension committee asked the Executive Committee to take up with the Secretary of Agriculture the serious situation confronting extension divisions because of the ruling of the United States Department of Agriculture that no emergency money can be used in States for overhead expenses in administering emergency work and that reimbursement can be made for only gasoline and oil used in connection with personally owned automobiles.

Emergency propaganda. The attention of the Executive Committee was called to a proposed agreement between the publicity department of the United States Department of Agriculture and those of the respective States relative to the matter of preparation and distribution of publications with a view of promoting efficiency and economy.

The frank of cooperative workers. The Executive Committee was asked to consider the wording of the frank used by those extension workers of the States who are directed by the extension divisions under the terms of the general "Memorandum of Understanding."

Hog cholera extension work. A number of extension workers are very anxious for a better understanding and a more definite agreement concerning the educational work in hog cholera control carried on by the Bureau of Animal Industry in the Central Western States. This committee seems unable to progress further with the matter. It was therefore suggested that the Executive Committee arrange with the Secretary of Agriculture for a conference in some Central Western State.

H. L. Russell,
W. D. Hurd,
G. I. Christie,
Alva Agee,
W. R. Dodson,
C. W. Pugsley, *Chairman,*
Committee.

L. A. Clinton of Washington, D. C. I take it that under the heading "Emergency work," second paragraph, the maintenance is contemplated on a sound basis of both the regular and the emergency work.

C. W. Pugsley. We hope to do that, of course.

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On motion, the report of the committee on extension organization and policy was received.

THE PRESIDENT. The report of the special committee on agricultural terminology will be presented by Director A. C. True.

A. C. TRUE. The committee on agricultural terminology does not feel that its work is in any way connected wtih the war emergency. Mere words weigh little nowadays. It has had no meeting and has no report to present at this time.

THE PRESIDENT. If there is no objection the report will be received as a report of progress.

The Chair is notified that the joint committee on projects and correlation of research has no report to make to this Convention.

The report of the joint committee on publication of research will now be presented by the acting chairman, Director H. P. Armsby.

REPORT OF COMMITTEE ON PUBLICATION OF RESEARCH

The chairman of this committee on the part of this Association, Dr. Raymond Pearl of Maine, as most of you know, was drafted into the service of the Food Administration about the first of June. Hence it becomes my duty as acting chairman to present a brief report.

As was understood at the time of its original appointment, the function of this committee has been the editing, in conjunction with a similar committee from the United States Department of Agriculture, of the *Journal of Agricultural Research*. This work has been carried on in complete harmony, the representatives of the Department and of the Association acting as a single editorial committee in all matters of general policy but as two separate sub-committees in the consideration of manuscripts offered for publication.

During the year ending October 31, 1917, five volumes of the Journal have been issued, aggregating a trifle over 2,000 pages and containing a total of 111 papers. It has been the consistent policy of the editorial committee to limit the scope of the Journal strictly to the publication of results of scientific investigation in the field of agriculture and we hazard the opinion that these papers compare not unfavorably in quality with those of any similar publication. Of these 111 papers, 57, aggregating 1,041 pages, were contributed by the stations. In other words, a little more than half of the matter has been the product of the scientific activity of the experiment stations. These 57 papers were contributed by 24 stations, the number per station ranging from 1 to 9 and averaging 2.37, equivalent to 1.1 for all the stations of the continental United States. Your committee feels that this is a very gratifying record, both as showing the liberal attitude of the Department toward the stations and as an indication of the extent to which research work is being carried on in the latter institutions. It should be added that on November 1, 27 addltional papers from the stations had been accepted and were awaiting publication.

The fundamental reason for the existence of the *Journal of Agricultural Research*, as of any scientific journal, lies in the fact that the work of the investigator is but half done when he has secured his results. He is equally bound, especially when deriving his support directly from the public, to make them known by some form of effective publication which

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shall render them available to his fellow workers, both present and future. The present emergency has brought to light some striking instances in which scientific results of immediate practical significance had been so effectively buried, years ago, in relatively obscure bulletins and annual reports, practically inaccessible to the great body of scientific men, especially in foreign countries, that they had never come to the knowledge of any wide circle of students and that their very existence had been forgotten. The *Journal of Agricultural Research* offers to the agricultural investigators of the United States a medium through which their results may be added to the world's common stock of knowledge, and in providing such a medium the Department of Agriculture has, we believe, rendered a substantial service to all students of agricultural science. At the risk of increasing the existing pressure upon the pages of the Journal, your committee ventures to suggest to the directors of the experiment stations the propriety of considering the advantages of Journal publication as compared with that in technical or special bulletins as a permanent record of the scientific work of their institutions.

Respectfully submitted,

H. P. ARMSBY, *Acting Chairman.*

On motion, the report of the committee on publication of research was received.

J. G. SCRUGHAM of Nevada. May I ask the chairman of the committee to explain briefly the advantage of the journal form of publication as compared with the separate bulletin series.

H. P. ARMSBY. The usual station publications are unfamiliar material to many scientific workers. It is a difficult task for any one outside the immediate circle in the institutions, and particularly difficult for foreign investigators, to keep track of all these publications. The journal form of publication seems to be a more effective means of putting these results into general scientific circulation. Most investigators get their knowledge of the progress of scientific research from journals which have a general circulation.

THE PRESIDENT. The chairman of the Executive Committee is recognized for final report.

REPORT OF THE EXECUTIVE COMMITTEE

The Executive Committee submits the following statements for consideration and action by the Association:

1. The report of a committee of the Agricultural Libraries Section of the American Library Association, signed by W. M. Hepburn, C. R. Green and M. G. Myer, has been received, but too late for discussion at this meeting. The report has been read in the meeting of the Executive Committee and the following recommendation is made:

That the report be received, printed in the Proceedings (see pages 28-30), and the attention of all presidents, deans, directors and librarians called to it as an important subject of discussion and action at each college and station.

2. The Executive Committee directs the attention of the colleges in the Association to the propriety of some recognition of students enlisted in the war by a proper certificate or diploma.

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Before the war closes thousands of the students in Land-Grant Colleges will be a part of the enlisted army abroad. It seems to the committee that many seniors might be given a war degree and diploma, while many of the undergraduates in the earlier years could be given a war certificate. These documents of recognition might under certain circumstances be highly appreciated both by student and family. The committee therefore recommends that college faculties give this subject appropriate consideration.

3. A report from the Engineering Section on the matter of classification of students under the selective draft law has been received. Other papers on the same subject were presented. The Committee is not of one mind on the problems presented and suspects that the same would be found to be true in the Association. The Committee has united on the following statement:

This Association, recognising the vital importance of trained men capable of rendering expert service in this war and the equally important problem of keeping our institutions, both colleges and stations, in a state of high efficiency in order that the fundamental factors of production, transportation and manufacture may not fail in the present great world crisis, also recognises that the supreme issue now is to win the war. This is primarily a military problem. The responsibility for the conduct of the war must in the last analysis rest with the Government.

This Association gladly puts all its resources at the service of the Government and in an unwavering loyalty directs its attention to the importance of utilising the faculties and students of our institutions to the best advantage in view of their education and, oftentimes, their training for special service.

The Association, therefore, declines to ask for special favors or special classification or exemption of students or faculties as a class but confines itself to a statement of the facts, leaving the final action with the Government where the final responsibility and authority lie. The Association, therefore, makes no recommendation in the case.

4. The Association yesterday voted to print an edition of the address presented by Dr. Lusk before the station section (see page 70). Requests have come to the Committee to print at once for circulation the proceedings on Thursday morning on the Smith-Hughes Act. Certain other requests are on the way either to the Association or to the Executive Committee.

Inasmuch as there is a limit to the available funds and inasmuch as there is a relative importance to this Association of papers presented and in view of established precedents as to what shall be done in the printing of "separates," the Executive Committee recommends:

(a) That the Association reconsider the action of Thursday concerning the printing of the paper by Dr. Lusk;

(b) That the entire matter of the preliminary printing of separates be referred to the Executive Committee with power to act.

5. The Executive Committee had under consideration a request for approval of the work done among the non-English speaking and foreign born adults in the rural communities. This work is urged by the Department of Education in the State of New York and was presented by the Supervisor of Immigrant Education of that State.

The Committee recommends that the movement to reach with training in English and citizenship these foreign and non-English speaking people

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be commended to the colleges and stations, and that these agencies, so far as practicable, cooperate with the State Departments of Education, and with the United States Bureau of Education, in their attempt to influence the movement for immigrant education of adults in rural communities.

6. The Executive Committee would report that it has held a conference with Mr. Hoover subsequent to the meeting yesterday and has arranged for a conference today with the Secretary of Agriculture. It has also had certain requests for occasional announcements of the work of the Committee from time to time throughout the year. These matters are largely executive and the Committee begs to announce that all matters referred to it either formally by the Association or informally by members of the Association are in mind and shall have its prompt and full consideration and be presented to the proper authorities.

7. The report of the committee on extension organization and policy was referred to the Executive Committee. It recommends that this report be adopted for printing in the Proceedings and that it be instructed to put the recommendations into effect in so far as possible with a view of securing the ends sought.

W. O. THOMPSON. If I may be permitted a remark touching item 1. The agricultural librarian's section of the American Library Association wishes that in some way the college, station and extension publications may find lodgment in all desirable libraries. Now the Executive Committee feels that the subject-matter of this report is somewhat important, but that it does not call for any special recommendation to this Association. It recognizes also the autonomy of the individual college and library in dealing with such questions, as, for example, the reservation of 150 copies of all documents. It recommends that this report be brought directly to the attention of the local library authorities and of all college presidents and station and extension directors. (See pages 28-30).

On motion, the report of the committee of the American Librarians' Committee was received and the recommendation of the Executive Committee touching item 1 was adopted.

W. O. THOMPSON. May I say further that the report of the committee on college organization and policy was referred to the Executive Committee. It has gone over the report and discussed it. The Committee has not been able, in view of its manifold duties, to give it continuous consideration for thirty minutes. This report was made a special order for this morning; notwithstanding, the Committee asks to be excused from making definite recommendations for the time being.

On motion, the recommendations of the Executive Committee touching items 2, 4, 5 and 7 were accepted and adopted.

THE PRESIDENT. Major Grenville Clark, representing Adjutant-General McCain, will now speak on "Military Training in Land-Grant Colleges."

MILITARY TRAINING IN LAND-GRANT COLLEGES

BY MAJ. GRENVILLE CLARK, Officers Reserve Corps, U. S. A.

The Adjutant-General greatly regrets that he is unable to be with you. He instructs me especially to say to you that he appreciates fully

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the tremendous importance of the work which you are doing, especially at this particular time, and that only very urgent business prevents him from keeping his engagement. He directed me to speak in particular of the part which the Land-Grant Colleges have played thus far in developing the corps of army officers and of the larger and similar part which they must play in the future.

May I trace with you for a moment the manner in which the officers' corps has been developed up to the present?

When war was declared the officers' corps of the Army consisted of about 7,000 regular officers, of about 10,000 National Guard officers, partially trained, and, perhaps, 2,000 reserve officers practically untrained. The War Department's first task was to provide officers to take charge of troops. It was futile to attempt to raise troops until officers were trained to take charge of them, with regard not only to their military instruction but their care in camp. As an expedient to that end, a system of intensive training was adopted in the reserve officers' training camps. That policy was decided on early in April, and, 40 days later, some 44,000 young men were assembled in the officers' training camps throughout the country. Those men were in general the pick of our youth, and among them, forming a nucleus which contributed largely to make those schools so successful, was a considerable proportion of the young men who had received training in the Land-Grant Colleges. These institutions took a very prominent part and contributed very largely of their best men. The reports received from the training camps indicate the value of their preliminary collegiate work.

There were commissioned from these camps on August 27, 1917, 27,341 officers. The work was of the most rigid character, the elimination was most severe, and I think we can justly say that a great work has been done in providing that great body of officers. One of the French officers who had been at several of the officers' training schools, and also at West Point, is reported as saying: "I congratulate you on your West Point, but I congratulate you more on your Plattsburg camps throughout the country." He said that they were producing a magnificent body of men, with basic training which should make them as good officers as there are in the world, when they have the necessary further experience.

The results were so good that a second series of camps was instituted, late in August, which were attended by about 23,000 men, from which it is expected to commission some 16,000 or 17,000 officers. Faster progress has been made in these second camps, and their men will be fully as well if not better trained than the others. You must remember that many of these young officers, with only three months' training, will be called upon as captains of companies of 250 men to take charge of raw recruits. There will be on the average in the new draft army hardly more than one regular officer to each 1,000 men. In other words, this new National Army is being built up practically by young men from civil life who have had nothing but this camp training, backed in some cases by what training was given in the Land-Grant Colleges and a few other colleges which had military instruction.

A third series of camps will be held, beginning in January, at which time something over a million men will be in service. It now is desired to afford every opportunity to the men in the ranks to obtain promotion and for ability to show itself. Accordingly, in planning for the third camp

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series, special emphasis has been laid on this object. The new plan beginning in January provides that about nine-tenths of the candidates shall be selected from the ranks of the Army, that is the Regular Army, National Guard and new National Army. However, recognizing the value of the work of the Land-Grant and other institutions having military instruction, the War Department has made special provision for 93 such institutions by providing a quota of 2,690 men who will attend those camps as their representatives. As a result of these three series of camps, there will be created by next April some 50,000 officers for combatant troops and some thousands of officers for the noncombatant troops. The net result is that a splendid start has been made and that we should be able to develop a very fine body of officers for our first army.

Gen. McCain asked me, however, to call your attention particularly to what must be done in the future. I think that most of us have now lost our illusions, that we see the absolute necessity of creating armies on a vast scale and that we have just made a start along this line.

In the British Army we understand that there have been commissioned thus far practically 300,000 officers and they are making them by the thousands every month. No doubt before this war is over we will have to create as great an army as England's; and we will have to train tens and possibly even hundreds of thousands of new officers. We are obliged to face the ugly fact that we must plan for large casualties. If you have been watching the weekly British casualty list no doubt you have noticed that the officer casualties average more than 1,000 a week, or at the rate of more than 50,000 officer casualties a year over and above the normal loss by discharge through sickness, incompetency, etc.

We have now a very slight reserve of officers, and must plan for one on a great scale, not only to replace officers but in order to officer new armies. Here is where the colleges of the country increasingly must be relied upon to furnish this great body of young men that can be drawn upon is to our advantage. In England, of course, the colleges are stripped of their young men. Where we have a dozen men left in college they have one, comparatively; and of course the same statement applies in Germany. We certainly must look forward to the time when our colleges must bear an even greater burden than hitherto, splendidly as they have done thus far. The college men are the natural leaders of our troops and the men we have got to rely upon to a large extent.

As yet, of course, although our efforts have been considerable, they have been nothing, considering our population, compared to what the English have done. If our military efforts were commensurate to those England is making, we should have under arms some 11,000,000 men and 500,000 officers. And if we were to measure up along side of France the discrepancy would be larger still.

As a purely personal and non-official suggestion, I should like to ask you to consider the question of making more elastic the law and regulations with regard to the Reserve Officers' Training Corps. The law is now purely a peace measure. It contemplates a leisurely sort of training covering four years, three hours a week the first two years and five hours a week the second two years, combined with two summer camps of four weeks each, amounting to something like 1,000 hours of training. Now, of course, it is absurd in time of war to proceed on a peace basis. A sophomore would not get ready to be a second lieutenant, under that scheme,

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until 1930 or 1931, when the war either would be over, or when at least his service would not be so valuable. It seems obvious that a thousand hours of military work done within a year are better than the same number done in four years. It is to my mind an unfortunate state of affairs that some colleges may run intensive military schools on the most modern methods accomplishing wonderful results, actually giving more military training in four or six months or in a year than the law requires during four years, equipping their young men for commissions, yet not obtaining commissions for them. It seems to me that the training should be reduced to the common sense basis of hours of training instead of years and thus be made of far more value to the country and to your students.

There will undoubtedly be an enormous call for young aviators. Here, again, we face the unpleasant fact that in modern warfare we have to use our best and bravest for dangerous work. The air problem is constantly changing. I doubt not that a year hence we will consider that our present program and effort amount to comparatively little as compared with our needs. The great reservoir for aviators, here as in continental countries, will be our educated young men; for observers, perhaps, even more than for aviators. Tens of thousands of these men will be needed. I doubt not that you will find that as a matter of military necessity the colleges will be called upon within the next year to supply great numbers of their men for this purpose. That is a further reason why military training should be pushed to the utmost, so as to equip these men to the best advantage, because infantry drill and ordinary military training are said to be of the greatest value for aviators.

It is perfectly obvious that great demands will be made on the educated men naturally fitted to lead troops during the next two years and that you will render vital service, both to the country and to your students, by equipping them to the best advantage. It is a waste to require the really well trained young college man to work up from the ranks when he can be put in as a subaltern and given the opportunity for leadership from the start. The British now consider it most wasteful to permit their best young men, fit for leadership, to go out and be shot without having had a chance to lead. Of course we are going to develop many splendid leaders out of the ranks, but we shall doubtless use both sources in accordance with the experience of this war.

THE PRESIDENT. The discussion will be continued by President Edmund J. James of the University of Illinois.

MILITARY TRAINING IN LAND-GRANT COLLEGES

BY E. J. JAMES

The chairman of the Executive Committee in asking me to discuss this subject did not indicate what particular phase he desired me to consider; nor did he say what points would be raised by the Adjutant-General's representative. At the risk, therefore, of not presenting the immediate points for discussion which may be the most necessary at the present time I shall limit myself to certain general aspects of the subject.

I am a great believer in the desirability of incorporating the feature of efficient military training into all Land-Grant Colleges and requiring such training of all students who may register in such colleges. I see no

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probability that the great war in which we are now engaged will end the period of international war. He must be indeed a confirmed and absolutely immovable optimist who thinks that out of this fierce conflict for world domination an era of permanent international peace is to blossom forth. I can easily believe that the enormous efforts which nations are putting forth at the present time in the attempt to enforce their wills by armed means upon the rest of the world will lead to such a temporary industrial, economic and military exhaustion that war of this scope is likely to be postponed for some years; but I believe that it will be necessary for the people of the United States to convince the world that they are in a position to defend themselves and their interests against any nation or combination of nations which may be formed against them; and that while we do not propose to go forth into a general scramble for the possession of additional portion of the earth's surface, we do not intend to let our reasonable rights be interfered with by the policy of other nations.

In my opinion that cannot be done in any effective way unless the world is convinced that our people are at any time willing and ready to defend their reasonable rights, if necessary by armed force. To the thorough establishment of such an idea belongs, in my opinion, the plain knowledge that the country at the same time that it is increasing its enormous wealth, developing its great territory, improving its mental, moral and spiritual condition, is also providing by a reasonable system for the preservation and development of an armed force which, in the last analysis, can be relied upon to defend the nation's rights and ideals and purposes. To this work belongs an efficient, highly-trained body of military officers. I believe that this training can be obtained in our Land-Grant Colleges more efficiently, more easily and at smaller expense than in any other way. I am, therefore, very decidedly in favor of taking such steps as may be necessary to utilize the possibilities in the situation.

We have seen, in the development of this great war, how difficult it is to overcome the prejudice of the people for established ideas or thoughts or modes of action. We should take advantage of this fundamental conservative quality of humankind in developing any great enterprise. We have already established a definite idea in the minds of the people of this Republic that the Land-Grant College is not only entitled to require a certain amount of military discipline from its students, but that it is morally bound to make and enforce such requirements because of the history of its origin and development. Personally, I think many of our colleges have failed most disgracefully in this duty to the Republic, and I hope that one of the incidental results of this great war and the excitement that grows out of it will be a new form of compliance with this fundamental obligation of our Land-Grant Colleges.

I am not an expert in matters of military training. I do not know how much training is necessary to lay the foundation for an efficient military officer. Those are things which must be determined by military men and I am personally willing to take their judgment upon it. This having been determined, I am in favor of putting it into the curricula of the Land-Grant Colleges by federal law to such an extent that no federal money shall be appropriated in the future to any such institution which does not insist upon this minimum of military training upon the part of every male student, this minimum being determined as that necessary to lay the foundation for the making of an efficient military officer.

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I am fully aware of the difficulties in the way of working out a curriculum. I am fully aware that our agricultural friends insist that four years' time devoted to the purposes of agriculture is entirely too short a period to accomplish the end—namely, efficient agricultural training. I know what our engineering friends say, that four or five years is too short a period to turn out a trained engineer. I know what doctors, dentists and all the other professional men say as to the necessity of extending their curricula and increasing the elements which it includes. Personally, I think that much of this talk is nonsense. We cannot undertake to teach everything that is known about agriculture or about engineering in four years, or in four times four years. The true college should train the young people to a point where they can complete their professional education by the practice of the profession itself. I am not, therefore, disturbed by that ever-increasing and ever-pressing demand which comes from every quarter to extend our curricula and to lengthen the time which the boy spends upon the school bench. There is, I believe, for any given group in society and for any given time and for any given profession a maximum period which can well be spent by our youth upon school and college benches. If more than that time is spent we are wasting some of the best months and years of the student's life and we are already doing that in many departments of our educational system. The objection, therefore, that this training cannot be put into these schools because of the demands made by all the different departments does not affect my feeling upon the subject in the slightest degree. I should be in favor of enacting into federal law, after careful consideration of the whole situation by experts in military and educational affairs, a provision determining the amount of time which shall be given to military training and the lines along which it shall be pursued, and let that be the one unchangeable element in the curriculum. Let that amount of time be taken out before anything else is taken and made a federal requirement for being allowed to avail one's self of the privileges of the institution which has been founded and supported by federal and state appropriations. There are other institutions in the country which young men may desire to attend. Let them do so. I am not in favor of requiring military training in all colleges and universities, though I believe it would be a good idea to offer certain inducements to take such training. I think it would be a good idea to provide the possibility of taking such training in all our colleges and universities, public and private, large and small, but I am especially in favor of making participation in the military training and preparation for efficient service in a national army as the *sine qua non* of continuance in the student body of a Land-Grant College.

We have already the prejudice and the favor or at least the acquiescence and tolerance of the public in the bit of military training which we now offer and enforce. I think we should continue to have that as well for the larger amount of time and the larger amount of work which an adequate military training would require.

Now I am in favor of this sort of work first and foremost because the Nation must look out adequately for developing and maintaining a strong military arm; and that for an indefinite time in the future, and because these institutions by their history, by their development, by their organization and their work thus far are peculiarly suited to offer the kind of training necessary to accomplish this end. It is justified primarily on the

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ground of national defense, and perhaps would not be justified on any other ground. In other words, if we did not have to defend ourselves, if we did not have to maintain an army, if we did not have to raise and support a military establishment, such military training would perhaps be undesirable, because the time of these young men could be better used in other ways. Its primary justification, therefore, is its necessity in a scheme of national defense.

But it is not by any means an altogether lost period even if it never be utilized and even if it never be necessary to utilize it—which, pray God, may be the case—because such training properly carried out is in itself a valuable piece of intellectual and moral training.

Even the ordinary inadequate play-at-military style of instruction which we have thus far carried on in our Land-Grant Colleges has a value of its own. I believe, for instance, that the freshman at the University of Illinois spends no three hours in the week which are of more value to him than the three hours spent in the military drill, though it include nothing but a lesson in manners and a lesson in setting up and style and carriage of the man and, of course, it can be made vastly more valuable than that. There is a distinct value in the study of military history as there is of industrial history or any other form of the story of human effort. There is, of course, a good mental discipline in the study of military engineering. In other words, the time spent upon the mastery of such a curriculum as is proposed would not be altogether lost even if considerations of national defense would not make such a curriculum necessary. I shall not discuss these side issues. My proposition is that an adequate military training should be a necessary part of the education of every man who attends or graduates from a Land-Grant College.

Now on the other hand, I also believe that the question of national defense is primarily a question for the Nation as distinct from the State or the community. Uncle Sam is the man who should support a military establishment for national defense against foreign aggression, and the financial burdens imposed by such a function should be borne by the Federal Government; or, of course, better stated, by the people of the United States in their capacity as members of the Federal State and as citizens of the United States. The entire extra expense of this feature of military drill and instruction should be borne by the federal and not by the state treasury or by other funds at the disposal of these Land-Grant Colleges.

The University of Illinois received from the Federal Government all told, through the Morrill Act of 1862, a sum constituting its endowment fund, in round numbers $650,000. One of the obligations of that grant was giving instruction in military tactics. It could, of course, have been given at very small expense by the officer which the United States Government detailed for this purpose. But the University of Illinois already has expended in the establishment and equipment of its military department a sum of money exceeding the sum total received from the Federal Government as the endowment of this institution. Now I maintain that the Federal Government should have borne this entire expense and should continue to bear it. If the military instruction is to amount to anything it calls for armories and arms and other equipment, and the expense of that particular part of the institution should be borne by the Federal Government pure and simple, and no attempt made to shift it on to other funds or on to budgets already sorely troubled and harrassed.

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I would go further. I have been speaking thus far simply of that minimum of elementary training in military affairs which would serve as the basis of the education of an officer and which may very well be taken without impairing the efficiency of the training offered in the other curricula of the university, that amount of training which the future farmer may take while completing his course in the agricultural college, the future engineer in the engineering college, the future lawyer in the law school, the future physician in the medical school. But over and above this, the Government has in these great schools with their ever-increasing attendance, a peculiar and wonderful opportunity for developing a military curriculum which shall train adequately the officers of a great national army of defense. They are distributed throughout the Union. Their admission requirements are not excessive and can be met by four-year high school graduates. Their students come from all classes of the community, rich and poor alike, and are ideal material out of which an officers' corps could be formed. By adding two years to their curricula it would be quite possible in the opinion of competent military authorities to give as good training as is offered at West Point, Annapolis, or at any of the great European military schools; indeed, some think that it could be done by the addition of a single year. If the Federal Government would offer to the students who wish to complete this military course and to qualify for appointment as regular officers, a pecuniary remuneration corresponding to the amount offered to the students at West Point and Annapolis, I think it would be perfectly possible to secure in the aggregate a very large number of men throughout the United States for this service, and that in the course of the years we should have continuously in the body politic men of any required age in adequate numbers to officer an army of a million men.

To sum up my thoughts on this subject:

1. Every Land-Grant College should be required to put into force and to maintain at a standard to be agreed upon and supervised by the Federal Government the minimum amount of military training required of every male student during the time of his continuance in such an institution, in any and all its departments.

2. The extra expense involved in providing for this instruction should be borne by the federal treasury.

3. The Federal Government should further provide for the expense of an additional year or two, as may be necessary, at each of these institutions, the completion of which would secure a fairly good training for an officer in the Army of National Defense, comparable in every way with the training now given by West Point or Annapolis. If the people of the United States had been wise enough to do this from the beginning of the Land-Grant Colleges, or even during the last ten years of their life, we should have saved out of the present enormous expenditures for federal purposes an amount sufficient to pay for this instruction twenty times over, and should have had from the very "drop of the hat," so to speak, a corps of officers far surpassing in number and in efficiency anything which our military training camps have been able to furnish.

MAJOR CLARK. There is one point I wish to mention. It seems unfortunate that the reserve officers are not used more freely as instructors. The present status of the matter is that there are no active officers on duty with Reserve Officers' Training Corps because every effort must be used directly in the war. There are not enough retired officers to go around.

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It is necessary to distribute the retired officers. It is not possible to take three retired officers and put them in a large institution and leave the small institutions unprovided for, even if that was advisable, because it entirely deprives the latter of services.

The question was recently referred to the Judge Advocate General as to whether reserve officers could be used, as was advocated very strongly by Gen. Wood and others; but unfortunately it has been held that an ironclad prohibition in the law forbade it. Section 45 provides that only officers with five years' service shall be detailed to a Reserve Officers' Training Corps. I do not think you could render any better service than to secure an amendment of that law. It would be a very excellent thing in my judgment for you to formulate a program of matters you think ought to be improved; and one of these is the securing of an adequate number of men to train the officers. The men exist. There are many reserve officers of character and ability with minor ailments. I would have some regular and retired officers who would pass from place to place to deliver lectures, lay out the courses and supervise the instruction conducted by the reserve officers. In this way all the colleges could be adequately equipped. I feel sure that the War Department will welcome suggestions from your Association.

W. O. Thompson. Should not this Association put itself on record in favor of the greater efficiency of this service? Should it not direct its Executive Committee to approach the War Department in this matter, especially as to the Reserve Officers' Training Corps? The decision of that Department to the effect that reserve officers can not be used for instructional purposes in our colleges is unfortunate, though doubtless in accordance with the terms of the law and of departmental procedure; but it works hardship and does not make for effective usage of the officers who are detailed or the students who are being taught. The Secretary of War seems to be favorably disposed to some action which may remedy the situation.

W. M. Riggs. Do I understand that the title to the uniforms worn by our students reverts to them at the end of the college year?

Major Clark. Yes, that is the latest ruling.

A Delegate. Could students entering the junior year and taking the drill for two years benefit by the law?

Major Clark. I fear that the law is too rigid to permit this being done. That question has been raised at Harvard and Yale, where courses are given which totalize in two years more than the equivalent of courses prescribed for four years. The law seems to be framed in such a way that only men who go through a four years' course of training can qualify. The law ought to be changed.

B. F. Andrews of Washington, D. C. College students have been urged to enter the training camps as a patriotic duty. Now many of these students have been drafted and are enlisted men, without control over their own actions and subject to War Department orders. Are these drafted men likely to be ordered into or can they volunteer for service in these officers' training camps?

Major Clark. They will be chosen simply because they have had

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the preliminary training but a very good system of selection is in operation. The good men will show up and they will have a fair chance.

BROWN AYRES of Tennessee. Several men on our staff who had been drafted have asked if they could be recommended to the third (January) camp, becoming thus an integral part of our pro rata. I stated that I thought, in view of the fact that they were in the military service, the proper procedure would be for them to apply to their superior officers, to indicate their desires and to file their credentials with them, but that I would refer the matter to the Adjutant-General's office. This I did, and I received a communication from the Adjutant-General to the effect that while it was proper that they should go into the camp through recommendation or detail from the regiment or corps that they were in, at the same time if any such former student applied to be put on our list, it would be proper for us to put him there, and that the whole question would then have to be settled by the examining officer to whom these lists would go.

L. S. RANDOLPH of Virginia. What constitutes real military training? I question whether three to five hours a week of drill amounts to very much in a military line and I am not surprised that the War Department questions such cases. Real military training keeps a man from two to three years in a military attitude all the time, gets him out in the morning for reveille, marchs him to his meals, to his classes, orders his actions, and even his thoughts along military lines.

W. M. RIGGS. A recent ruling in regard to uniforms may be of interest to the members of this Association. In General Orders No. 49, there are two outfits listed—a campaign outfit and an olive-drab outfit. According to a ruling received from the War Department, an institution may select from the two lists sufficient articles to make up one complete uniform.

MAJOR CLARK. This understanding is a correct one.

W. M. KERR of Oregon. The question under consideration this morning is of the utmost importance, and the discussions emphasize the wisdom of the suggestion that this Association authorize its Executive Committee to take such steps as may in its judgment be deemed best in securing the necessary amendment to the law and changes in army regulations in order that the objects we have in view may be accomplished. The law should be such that War Department officials and college executives may have the necessary latitude of judgment in working out means by which results may be obtained, and to that end I move that the suggestion of the chairman of the Executive Committee be adopted and the authority requested in these matters be given it.

The motion, being seconded, was carried.

C. C. THACH of Alabama. What is the status of the "Four Weeks Summer Camp," authorized by the Federal Act concerning the Reserve Officers' Training Corps in Land-Grant Colleges? Certainly the law has not been complied with in this respect. Of course, everyone thoroughly sympathizes with the present situation of intense pressure upon the War Department; but, at the same time, it is absolutely necessary that there be

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complete execution of the law by both of the parties concerned in the contract. Students drill, they drill over time, they fulfill all the obligations imimposed upon them by the federal law. Therefore, we respectfully ask that the Government, on its side, completely fulfill the requirements of law in regard to the summer camps. These camps will give incentive to students in the advanced course of the Reserve Officers' Training Corps.

May I further make inquiry as to whether or not the uniform becomes the property of the student at the end of the year? The uniform bears many distinctive marks, "brassard," etc., etc. Will the ex-student during vacation be allowed to wear this uniform?

W. O. THOMPSON. Will persons having such inquiries as has been suggested by President Thach and others put them in writing and hand or send them to the Executive Committee, so that they will not be overlooked or forgotten?

THE PRESIDENT. Before Major Clark goes, I want to express on behalf of the Association our appreciation of his presence here this morning and of the message he has brought.

We will now pass to the special order, which is the consideration of the recommendations contained in the report of the committee on college organization and policy. As has been stated, the Executive Committee is not prepared at this time to make definite recommendations concerning the disposition of the resolutions referred to it. Hence I will call upon President Riggs to present them to the Convention for such action as it may care to take.

W. M. RIGGS. I will abbreviate as much as possible by reading the resolutions or recommendations as the case may be:

"*Resolved,* that this Association instruct its Executive Committee to make such representations to the proper authorities as shall make clear the belief of this Association that steps should be taken in the immediate future to secure the desired unity of effort in this great task of mobilizing the American food supply.

"*Be it further resolved,* that the Executive Committee be instructed to keep the members of the Association informed as to the various steps taken by national officials or agencies from time to time looking toward the development of general policies affecting the entire country, particularly the Agricultural Colleges."

I move the adoption of those resolutions.

The motion, being seconded, was carried.

W. M. RIGGS. In regard to the Smith-Hughes Vocational Education Act the committee makes the following recommendations:

"(1) That this Association take steps at this meeting to effect such permanent relationships with the Federal Board of Vocational Education as will best assist our Land-Grant Colleges and Universities in performing their service and finding their place in the scheme of nationalized secondary vocational education.

"(2) That steps be taken also to secure official rulings on such points as may be raised in connection with the possible conflict in the operation of the agencies developed under the Smith-Hughes Act, with the cooperative extension work authorized under the Smith-Lever Act.

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"(3) That the Association provide in the near future for the distribution of a document, covering general rulings or suggestions on points that are now at issue or that are likely to arise, in order that each one of our institutions may have some authoritative advice as to the wise and fair policies for them to follow in its own States."

On motion, this resolution was referred to the Executive Committee.

W. M. Riggs. The recommendation covering the Smith-Lever Act, reads as follows:

"In addition to any conferences that may be held by representatives of the directors of extension service, we believe that there ought to be, under the auspices of the Executive Committee of this Association, a very definite approach to the Department with reference to the final settlement of such questions as affect the general policy of our institutions."

I move the adoption of the recommendation.

The motion, being seconded, was carried.

W. M. Riggs. The recommendation of the committee in regard to the Land-Grant Colleges reads as follows:

"We, therefore, recommend that the Executive Committee be requested to report at some future meeting of this Association upon the advisability and feasibility of securing an authorized and comprehensive history of the Morrill Act Institutions with special emphasis upon educational policy."

I move the adoption of the recommendation.

The motion, being seconded, was carried.

The President. The election of officers is now in order.

The name of Eugene Davenport of Illinois having been presented and the nomination being seconded, on motion the secretary was instructed to cast one ballot for Eugene Davenport of Illinois as president for the ensuing year; and he so cast the ballot.

Other officers were elected in similar fashion as follows: Vice-presidents, C. A. Lory of Colorado, A. M. Soule of Georgia, J. G. Lipman of New Jersey, A. F. Woods of Maryland, R. W. Thatcher of Minnesota; secretary-treasurer, J. L. Hills of Vermont; bibliographer, A. C. True of Washington, D. C.

Reports were made by the nominating committees of the sections as follows:

College section—For chairman, E. C. Perisho of South Dakota; for secretary, R. D. Hetzel of New Hampshire; for program committee, the chairman and secretary; for members of Executive Committee, W. O. Thompson of Ohio, R. A. Pearson of Iowa, W. M. Riggs of South Carolina.

Engineering division of the college section—For chairman, W. M. Riggs of South Carolina; for secretary, A. A. Potter of Kansas; for program committee, the chairman and secretary.[1]

Home economics division of the college section—For chairman, Isabel Bevier of Illinois; for secretary, Mary E. Sweeny of Kentucky.

Station section—For chairman, W. M. Jardine of Kansas; for secretary, W. P. Brooks of Massachusetts; for recording secretary, W. H. Beal

[1] For officers of the Land-Grant College Engineering Association, see footnote, p. 255.

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of Washington, D. C.; for program committee, the chairman, secretary and recording secretary; for members of Executive Committee, W. H. Jordan of New York, H. L. Russell of Wisconsin.

Extension section—For chairman, C. R. Titlow of West Virginia; for secretary, E. C. Johnson of Kansas; for recording secretary, Bradford Knapp of Washington, D. C.; for program committee, the chairman, secretary and recording secretary.

On motion, the nominations of chairmen and secretaries by the several sections and divisions were approved.

W. O. THOMPSON. The chairman of the Executive Committee presents and moves the adoption of the same resolution that was presented and adopted last year, reading as follows:

"The Committee recommends that it be given power to act in case of any unfinished business or resolution overlooked at the closing session. This recommendation is unusual and it is made simply because in the press of business some matters may have been overlooked. If adopted, no question can arise as to the legitimacy of any action the Executive Committee may deem it wise to take."

The motion, being seconded, was carried.

W. M. RIGGS. I have an important matter to present from the engineering division touching the establishment of engineering experiment stations. It is needless in this presence for me to rehearse the difficulties we have met in our efforts to secure legislation to establish these stations.

The Newlands bill, which was the first introduced, provided that the federal appropriations should go only to the Land-Grant Colleges. Objections raised by some of the separate State Universities made the passage of the Newlands bill practically impossible. The Smith-Howard bill was then introduced, which left to each legislature the decision as to which institution within state borders should receive the federal appropriation. This bill the Land-Grant Colleges opposed. There appears to be no hope that either the Newlands bill or the Smith-Howard bill will pass.

The engineering division selected a committee to study the question and make a report, with the understanding that the whole matter would be referred to the Executive Committee for the exercise of its wise discretion. The suggestion of the committee is that the $15,000 federal appropriation be made contingent upon an equal appropriation within the State and that the federal appropriation shall in all cases go to the Land-Grant College, whereas the legislature shall direct the state fund to such institution as it sees fit. Furthermore, in the event that the legislature should fail to make an appropriation, the Land-Grant College may on its own initiative and out of its own funds, in whole or in part, pay the compensating fund. It is proposed that the federal administrative agency shall be the Department of Commerce working through the Bureau of Standards.

In behalf of the engineering division, I move that the Association express approval of these recommendations, referring them to the Executive Committee for final decision and action.

The motion, being seconded, was carried.

E. C. PERISHO of South Dakota. In case a legislature designated a Land-Grant College as the recipient of the compensating fund, would it

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be necessary to appropriate a like sum for the establishment of a station at some institution other than a Land-Grant College?

W. M. Riggs. Not at all. In case of a contest, the two institutions could thrash out within the legislature the question of the destination of the state fund. The federal fund would go to the Land-Grant College.

J. G. Lipman of New Jersey. I propose the following resolution:

Whereas, the supply of labor, seed, fertilizer and agricultural implements threatens to be inadequate for maximum production; and

Whereas, it is highly essential that immediate consideration be given to equitable and prompt distribution of the raw materials and implements needed in agricultural production;

Therefore, be it resolved, that this Association respectfully urge on the National Administration the wisdom of at once organizing such labor resources as may be needed for the coming crop season and of making available accurate information on the supply, movement and distribution of raw materials and implements required in crop production.

I move that this resolution be referred to the Executive Committee for consideration and action.

The motion, being seconded, was carried.

E. A. Burnett of Nebraska. In view of the intimate relations existing between the Federal Government and the Colleges represented in this Association, I would suggest the propriety of asking the Executive Committee to consider the advisability of investing such part of our surplus funds in Liberty Bonds as may be deemed advisable; and I so move.

The motion, being seconded, was carried.

W. O. Thompson. President H. J. Waters of the Kansas Agricultural College retires from this Association by reason of having accepted the editorship with the *Weekly Kansas City Star.* I think it would be entirely appropriate for this Association to recognize his long service in its behalf. He has served as a committee member and otherwise, with intelligence, devotion, interest and enthusiasm. I am quite sure that while he is retiring from this Association for other service, he will not retire from the interests that are represented here.

I move that this Association express regret that he makes formal retirement and voice its hope for his success in his new field.

The motion, being seconded, was carried.

On motion, the general session of the Association adjourned *sine die.*

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MINUTES OF THE SECTIONS

SECTION ON COLLEGE WORK AND ADMINISTRATION

AFTERNOON SESSION, WEDNESDAY, NOVEMBER 14, 1917

The section was called to order at 2 P. M. by the chairman, President C. C. Thach of the Alabama Polytechnic Institute.

THE CHAIRMAN. Presidents W. E. Stone of Purdue University, Indiana, C. A. Lory of the State Agricultural College of Colorado and W. H. Smith of the Mississippi Agricultural and Mechanical College will please act as nominating committee for the section.

THE CHAIRMAN. The topic of the first paper appeals to all who are connected with college work—"The Best Things Done by the Colleges to Aid the Government in the War Emergency." President E. C. Perisho of the South Dakota State College of Agriculture and the Mechanics Arts will present the paper.

THE BEST THINGS DONE BY THE LAND-GRANT INSTITUTIONS TO AID THE STATES AND NATION TO MEET THE EMERGENCIES OF THE WAR

BY E. C. PERISHO

From the very hour that President Wilson declared that a state of war existed between the American Republic and the Imperial Government of Germany, no part of our Nation, no portion of our people responded more quickly or more intelligently than did the men and women of the Land-Grant Colleges. From every one of these institutions there were sent at once to state and federal authorities not only assurances of loyalty but the free offer of men, military departments, laboratories, machine shops, experiment plots, engineering plants, agricultural and extension workers; for none knew better than our colleges what war meant to the social, industrial, economic and educational life of our people. Nor did our institutions act too quickly, for it began at once to be apparent to all that if we were to help win this great war, it could not be done unless America should produce increased quantities of food.

Upon our entry into this war, we were told that the American farmers must produce larger crops if we were to win. That need is greater today than it was six months ago.; all that was done last year must be more than duplicated the next 12 months. We must not only feed our Army and assist our Allies but produce food enough for our own population in such quantities that at reduced prices all may be well fed at the relatively lower salaries now received. A hungry people in a land of plenty can never rise to the heights of patriotism. To meet the food emergency we must not forget:

1. That there are 25,000,000 less cattle, 50,000,000 less sheep and many millions less hogs in the world than there were three years ago.

2. That more than 10 percent of our grain crops are yearly destroyed by insects and that we wasted the past season 30,000,000 bushels of wheat in the harvest fields, threshing yards, elevators and freight cars.

3. That our Allies will need over 300,000,000 bushels of wheat this year while the surplus of our last harvest was less than 100,000,000 bushels.

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4. That the Secretary of Agriculture says that the American farmers should produce in 1918 over 1,000,000,000 bushels of wheat. This can be done if the winter wheat acreage is increased by 18 to 20 percent. If we do not now have 47,000,000 acres of winter wheat, or if we find early next spring that we do not have this amount of promising winter wheat, then we of the spring wheat areas must see to it that enough spring wheat is sown to make up the deficit. It is my opinion that there will not be 47,000,000 acres of winter wheat sown and that some of what is sown will not prove to be a successful stand. In any event we cannot begin too soon to push the spring wheat campaign.

The necessity of increased effort on our part is clear not only to aid the farmer to produce more stock and grain but to help him to secure pure and viable seed, fertilizer and sufficient labor. May I emphasize here the fact that totally untrained farm help is no better for agricultural production than is an unskilled workman in a shop or manufacturing plant. The outcome on many South Dakota farms this summer where men were "shipped in" to take the place of farmers' sons who had enlisted was fairly tragic. Three such men were but a poor equivalent of one farm-trained man.

Nor is our duty simply to aid the farmers. Our main function is to continue to train young men and women for positions of leadership along technical lines. The Nation needs food; but it also needs men technically trained to do its work. We must impress upon our young people that in securing a practical education they are performing a patriotic duty. More engineers will be needed during the next 10 years than in any decade in our history; they will be greatly needed during and after the war in every country that has been engaged in the conflict. For years after peace is established there will be unparalleled demand for engineers, especially in the United States, France, Russia and China, as well as in Mexico and South America. France is now asking for 10,000 engineers; Russia for 15,000. We will soon need 1,600 or more men and probably 1,000 young women properly qualified as county agents—and they are not readily found—and there is still greater demand for emergency food agents. And the successful preparation of young women for their varied and special duties is important. Whether we are at war or peace, our homes must be maintained, for the basis of our national strength is to be found in the home life of our people; and during national emergencies it is especially important that our women thoroughly understand the problems of food, clothing, hygiene and household administration.

From the more than 40 answers to my inquiry as to the best things done by the individual Land-Grant Colleges to meet the present emergencies, and from what is generally known of their work, I am convinced that never before have our colleges worked in such harmony or with such a definite aim or with such general efficiency. If any one ever questioned the wisdom of the Federal Government in establishing these colleges supported by state and federal funds, the work they have done during the past months should forever stop such criticism. If we continue to serve the people and the country during the remainder of the war as efficiently as we have thus far, there should be no question as to the duty of Congress to continue the Nation's present program of federal aid until not only the experiment station and the extension division but engineering and home economics are provided with federal funds.

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It is evident that all the colleges are engaged in many of the same activities. I can mention only a few of the more important features, the leading lines of work accomplished, and briefly refer to some of their special achievements. If time permitted it would be interesting and profitable to quote extensively from the answers to the questionnaire. However, the work in the main has been along the following lines:

1. Effective cooperation with State and Federal Governments.
2. Production and conservation of food materials.
3. Extension work (with women, boys' and girls' clubs and publicity departments).
4. Experiment station work.
5. Military work.
6. Special courses.
7. Activities of students, faculty, members, and alumni.

I. Cooperation with State and Federal Governments

Several State Colleges began emergency work before the declaration of war. In Massachusetts a month before war was declared, at the suggestion of the president of the State College, the Massachusetts Federation of Rural Progress appointed a committee to serve as a sub-committee of the State Committee of Public Safety. A conference of the department heads was held at the college on March 5 to determine the best way in which the college might serve the State in food production.

In South Dakota a definite campaign for greater stock and crop production was launched by the extension men early in March. The president of the State College of Colorado says that "ever since the beginning of the European War in 1914 we have been giving some study to the problem of what we could do to serve our country if it was drawn into the war. Consequently the declaration of war in April found us not altogether unprepared. Throughout the study of this problem, we have steadfastly held to the position that as a faculty we had no right to offer the services of the institution as such to the Government, that we were a state institution, that our services would have to be offered through our Board of Control to our Governor, and then by him, if he thought best, to the National Government. Of course in this we did not lose sight of the fact that we were carrying on certain cooperative work with the Federal Department of Agriculture in the experiment station and the extension service. Immediately on the declaration of war, therefore, we closed up our survey of institutional resources in men and equipment and presented this to our board at its meeting April 11, which in turn offered the resources and the men to the Governor for such use as he might make of us. Following this offer, the president was appointed a member of the Council of Defense and chairman of the Committee on Food Production, Conservation and Marketing of the Advisory War Council of the Colorado Council of Defense.

"The professor of agronomy is chairman of the seed committee, the professor of farm machinery is chairman of the tractor committee and the professor of animal husbandry is vice-chairman of the livestock committee, and as chairmen are members of the committee on food production, conservation and marketing.

"Our marketing specialist in charge of our Colorado office of markets maintained cooperatively by the federal bureau of markets and the college,

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is chairman of the committee of marketing and ex-officio member of the committee on food conservation, production and marketing. The director of the extension service is a member of the committee on county organization of the advisory war council, and all of us have been called upon fully and freely to carry our share of the work of the Council of Defense."

The Georgia State College of Agriculture and Mechanic Arts was peculiarly fortunate in the service it was able to render. Its president says that "Several months before the food bill was passed we had undertaken a campaign to encourage food production. This was organized largely through the energies of our extension division. As a result the corn crop was increased 12,000,000 bushels, sweet potatoes 4,000,000 bushels, velvet beans 12,000,000 bushels, peanuts several million bushels, with cotton a normal crop. Georgia claims to be the only State in the Union showing an increase in the number of hogs." As an example of how the colleges have worked with the committee on food supply in the various states, I quote the following from the Connecticut Agricultural College: "The college offered its services to the food supply committee. The offer was accepted and four members of the faculty spent the summer with the committee at Hartford. Part of their joint work was the publication of 25 bulletins and leaflets."

The Agricultural and Mechanical College of Texas appointed a committee of national defense consisting of seven members, of which the president of the college was chairman. This committee worked with the Council of National Defense in Washington and the State Council of Defense.

A most interesting situation exists in Vermont. The university trustees gave to President Benton a year's leave of absence on full salary in order that he might devote all his time to the National War Work Council of the Young Men's Christian Association. Only his traveling expenses are paid by the Y. M. C. A. He is now actively at work in Paris, being in charge of the work in that city for American soldiers. The head professor of home economics has been commandeered by Mr. Hoover for the furtherance of his campaign and she also was given leave of absence with full pay by the university trustees.

II. Production and Conservation of Food; Boys' and Girls' Clubs

The extension department of Purdue University was designated by the Governor to take entire charge of the campaign for stimulating food production and conservation. It immediately organized committees in each of the 92 counties, and as a result it is estimated that fully 1,000,000 acres of corn were planted in excess of the usual acreage. A city gardening campaign was carried on, resulting in the planting of 200,000 such gardens. Labor committees were organized for securing and forwarding laborers to farming centers. A campaign was carried on to increase the output of dairy products. A state-wide campaign for wheat improvement was inaugurated, including provision for an adequate supply of seed wheat. Systematic and effective effort has been made to increase the number of silos. More than 300 canning and drying demonstrations were given. Canning clubs among school girls have been organized with gratifying results.

Ohio State University has done valiant service through the boys' and girls' clubs, 10,000 being enrolled in corn, wheat, pig-growing, baking, canning clubs, etc. The stimulating effect and ultimate results of this

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work can hardly be estimated. A movement was started to interest the cities in vacant lot gardening. Horticultural students were trained and sent to 68 cities where school children were addressed, evening meetings held and personal supervision of vacant lot gardening conducted. No less than 20,000 people were addressed. Widespread interest was aroused and gratifying results obtained and, finally, 200,000 bulletins on gardening were distributed.

In North Dakota special attention was given to demonstrations of conserving food by canning, preserving and drying. War gardens were emphasized, and, as a result, food production was increased. We are all acquainted with the exceptional work done by President Ladd in demonstrating that excellent flour may be made from low grade wheat.

Mississippi reports in one paragraph to the effect that it did its war emergency work in teaching the student body loyalty to the flag, justification of our country's joining in the war struggle and the exceptional need of increasing the production and conservation of food.

Oklahoma has been successful in its club work. "The membership in these clubs has grown to 18,622, divided among the following clubs: Corn, 2,998; cotton, 1,919; pig, 1,880; wheat, 923; calf, 443; three-crop, 212; sheep, 31; bees, 20; potatoes, 15; farm makers (colored) 493; better bread, 1,717; canning, 2,082; poultry (girls only), 2,132. All club members have been impressed with the fact that every additional acre of food stuffs raised and every can of food saved helps to win the war. The wheat club is in its first year and is a war measure, each boy sowing from 5 to 10 acres of wheat according to directions."

Connecticut dealt effectively with the vacant lot and backyard garden. It also strove to utilize the spare time of factory workers and boys and girls in agricultural production. Between 30,000 and 40,000 people took up this line of production under its direction. Seven summer canning schools were held at which 600 women were instructed not alone to conserve food themselves but how to teach others to conserve.

In Colorado, "Two home demonstrators have been installed for city work, one in Denver and one in Pueblo. Three county district home demonstration agents are at work, and we expect to place two or three more. It would be useless to say all this work was accomplished without much difficulty. I am happy to say that the results generally have been good. We, in Colorado, as elsewhere, had a wave of excessive organization."

Georgia reports that her agricultural wealth has increased this year by $250,000,000, much of which is due to increased production.

III. The Extension Division

Our institutions from the Atlantic to the Pacific are a unit in according first place in war emergency work to their extension divisions in conjunction with their publicity departments. The president of Michigan writes: "Looking back on the events since the declaration of war, I believe the greatest good that the college has accomplished has been through its extension and publicity service looking toward increased crop production throughout the State by means of our system of county agents under the Smith-Lever law supplemented by state-wide publication of matter which would encourage the farmer in his efforts to respond patriotically to the call of the government. We have done, I believe, remarkable things."

In Montana, the extension faculty held many meetings. The county

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farm agents had immediate charge of these meetings, made arrangements, distributed advertising and conducted the exercises. Forty thousand flyers were prepared for their use and 6,000 postal cards were distributed pro rata to counties in proportion to the number of meetings held in each. Information concerning the crop, livestock and food situation was distributed, 35 faculty members spoke at patriotic meetings and 25 women under the direction of the home economics department gave demonstrations in food use and conservation.

Idaho now employs 16 county agents and there will be 30 to 35 workers in this particular field in the near future. The demonstration agents have been particularly active in South Carolina.

In Nevada successful work was done to meet the labor situation. The college cooperated not only with the Federal Government but with the State Labor Bureau. A labor specialist assisted in this work throughout the harvesting season. In each agricultural town some person was selected to act as a labor distributor to whom labor could be sent and from whom farmers and others could secure help. Many posters were used. Each community was informed that while labor could not be guaranteed it would be distributed from places with a surplus to fill shortages in other districts. The plan was helpful in that it prevented men from seeking labor in a locality where no shortage existed. More active measures will be necessary next year to supply the required harvest labor.

Ohio will hold 430 farm institutes reaching 500,000 people. These will have a patriotic as well as an economic setting. It has issued 500,000 special bulletins on crop production, in addition to the same number of regular bulletins. Its home economics department has worked in close cooperation with the State Council of Defense, and early in May had registered approximately 250 women for volunteer service in food conservation work, mostly state university graduates. These volunteers have been called upon for lectures, demonstrations, cooperation with local committees in special campaigns such as enlisting the housewives as members of the Federal Food Administration. The college has a permanent force of workers consisting of 104 county agents, extension specialists, institute lecturers and field workers, about 70 of whom spend their entire time in the field instructing, directing, demonstrating and in every way possible trying to increase food production.

Iowa sums up the situation for all our institutions when she says that "Our extension department and experiment station are cooperating with the National Department of Agriculture in every possible way."

"As soon as it became evident that the United States was to take part in the world's war for democracy, the Nebraska extension division made the aid of the Government its first concern." Its principal efforts were:

1. An information service which published and distributed 23 war emergency bulletins, in addition to 70,000 pages issued by the publicity department.

2. Special meetings attended by 300,000 people.

3. Home demonstration work, with 25 counties organized in the near future.

4. Junior extension work whereby $30,000 worth of pork, $90,000 worth of chickens, 2,400 acres of corn were produced and wherein 2,600 girls have joined cooking schools and 6,000 boys and girls engaged in gardening projects, the products of which aggregated $50,000.

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5. County agent work, the agents doing exceptional work in persuading farmers to plant corn, oats or spring wheat on lands where the winter wheat was killed, in establishing labor and market bureaus which have proved of great value to the farmers in Nebraska and adjoining states.

New York (Cornell) has cooperated with the State Food Supply Commission and has been exceptionally active in preventing crop losses by plant diseases and insects. For example, 21 community potato spraying organizations were formed which sprayed 5,000 acres; expert inspectors have visited 523 potato growers to determine trueness to type and freedom from disease. There are now in 36 counties emergency food conservation agents and permanent home demonstration agents in five counties and city organizations in Albany, Auburn, Buffalo, New York, Rochester, Rome, Syracuse and Utica, the funds of the State Food Supply Commission being used for the purpose. New York's greatest problem was food conservation. Food demonstration meetings were held in rural sections up to October 1, together with other public meetings, county fairs, etc., thus interesting fully 87,000 women. Successful though she has been this year, Cornell modestly claims that the best things she has done were those upon which she had been working in a smaller way for many years, namely, the organization of men and women for self-help.

Utah reports that her conservation emergency work was organized through the medium of a large central committee composed of representatives from each county, the college president being its chairman. A demonstration train of 13 cars called the "Preparedness Train" was run in conjunction with the Universities of California and Nevada and with the Salt Lake Route. Twenty-four towns were visited in 28 days and 61,000 people were reached. The women responded nobly to the food conservation appeal.

Kentucky emphasized the need of increasing the supply of meat producing animals, dairy products and the retaining of breeding stock on the farm.

South Dakota helped: 1. In animal disease control, especially with cattle on the western plains. 2. In dairying, featuring the increase in the number of cows and creameries. 3. In agricultural engineering, chiefly with farm buildings, land drainage and sewage problems. 4. In livestock improvement, assisting not only stockmen but aiding materially the boys' and girls' club activities. 5. In farm management, establishing a system of accounting on more than 1,000 farms.

Kansas has been active in the food production and conservation campaign. Its president was chosen chairman of the State Council of Defense which organized a strong agricultural committee with several sub-committees, on which were placed representatives of the college. Thus the organized extension forces were in close touch with the program and were able to assist in making it effective. Furthermore, the college president was chosen Food Administrator for Kansas and much of the educational work in connection with the administration of that office has been conducted through the regular extension channels.

IV. The Experiment Stations

The experiment stations have done excellent work, not only in vitalising their research efforts but in the personal work of the entire staffs. For example, in South Dakota, the director is secretary of the Stock Breeders'

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Association, the vice-director and horticulturist is secretary of the State Horticultural Society, the agronomist is secretary of the State Grain Growers' Association, and the dairyman, the veterinarian, and entomologist hold similar positions. All these men have set forth to their several memberships the best ways in which they could help the Nation by producing and conserving food materials.

In Arizona, research projects were remodeled to make them economically more productive; in Colorado, the station men aided in the establishment of storage facilities for perishable crops, in one district storage being provided for 1,900 cars of potatoes; in Texas, the station did much to overcome adverse conditions wrought by the drouth; and in Maine, New Hampshire, New Mexico, Oregon, Rhode Island, Vermont, Washington and Wisconsin the station staffs worked on emergency problems. Pennsylvania and Illinois have been conducting extensive experiments in food production and conservation. Pennsylvania expects to start in the near future a number of projects which she hopes will be of great value to the State and Nation.

V. The Military Departments

The military departments not only have had an important part in this war emergency but effectively have been getting the Nation ready long before hostilities began in Europe three years ago. All of our institutions have maintained military departments giving systematic instruction in military tactics under an officer of the United States Army. From the students of these colleges, with their two years or more of military training, comes the greater number of our newly commissioned officers.

Indiana has trained 1,000 men, furnished 21 army officers from her faculty, 236 graduates, most of whom are officers, and 379 undergraduates. Michigan has furnished more than 500 men, most of whom are officers. Georgia has given the army 40 men from her faculty and considers her military contribution the most important work she has done for the war. New Hampshire furnished quarters and subsistence during August and September for about 500 soldiers, while fully half of the senior class and many other undergraduates entered the officers' training camp in May, nearly all receiving commissions. Wyoming considers that the most significant part of that institution's work is found in the number of last year's students now in military service. New Jersey established a war service bureau which sent out weekly news letters. Montana organized her military department into a battalion of four companies, consisting of 295 men, 40 of whom are officers. Oklahoma has 100 graduates holding commissions in the Army and Navy. South Dakota has given a large part of her senior class and many upper classmen to the Army, many of them being officers.

VI. Special Emergency Courses

One of the efficient ways in which our institutions have helped the Nation is in the establishment of new emergency courses, offered both to the students and to the people generally.

Iowa early in the spring introduced an extra hour drill open to students and faculty alike, thus making it possible for more than 2,000 men to gain a military training at Ames; and she also has given a six weeks' summer course in military training. Indiana offered three special courses of instruction during the summer, at one of which 400 women and girls

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gained instruction in food conservation and at another 100 farmers were taught the use of farm tractors. Montana offers among new courses a one-year military service course, a one-year nurse's course, and a three-months' gasoline engine course. South Dakota established one-year war emergency courses in animal husbandry, agronomy, chemistry, dairying, entomology, and veterinary science, as well as special courses in engineering, telegraphy, home economics, traction engineering and extension work. Arkansas, California, Colorado, Florida, Louisiana, Minnesota, Oregon, Tennessee, Vermont, Virginia, Washington and West Virginia have offered successful special courses; and so has practically every Land-Grant College.

Had it not been for the efficiency of our publicity departments the excellent work done by agricultural, home economics and extension workers could not have been accomplished. Much credit is due the women of our colleges for their unselfish and patriotic help. All of our Land-Grant Colleges released students from regular classroom work if they joined the military or agricultural forces of the Nation. We are all a unit in giving not only our students but our faculty members to the war work of the Government.

We have aided the Nation in supporting the Red Cross, the work of the Young Men's Christian Association, the Young Women's Christian Association and The Knights of Columbus and in buying Liberty Loan Bonds.

Our agricultural colleges have long stood close to the farming and engineering classes, and now in a most effective way we have become co-workers with the military, legislative, industrial, commercial, financial people, in fact with every phase of our national life. This new opportunity brings with it a large responsibility. With the same zeal and intelligence which marked our efforts in the present emergency we will prove ourselves worthy of our new and larger mission. The work of our institutions this year and in the years to come will demonstrate that the Land-Grant Colleges are not only efficient but thoroughly patriotic and loyal. Only a few of our faculty members can join the Army or Navy; but all of us in common with other citizens can help finance the war and aid the organizations which are helping the soldiers.

However, to us comes a greater challenge to service, the training of young men and women, not simply for needed emergency positions of a technical character in order that they may become better farmers, stockmen, abler accountants and demonstrators, more skillful engineers and builders, more worthy home makers, but as fully equipped citizens of the better nation and world which are to be.

THE CHAIRMAN. "How the Land-Grant Colleges May Organize to Serve the Government in the War Emergency," will be developed by President A. M. Soule of the College of Agriculture of the University of Georgia.

HOW THE LAND-GRANT COLLEGES MAY ORGANIZE TO SERVE THE GOVERNMENT IN THE WAR EMERGENCY

BY A. M. SOULE

The slogan "food will win the war" is not an idle conception of a diseased imagination but a basic fact. History shows that food has been the determining factor in most of the great campaigns of which we have a record. Since 1914 the provision of suitable rations for the nations at

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war has often overshadowed the work of the military establishment. The resistance of Germany is based on the success with which she has been able thus far to mantain her food supply. The rise and fall of many of the allied ministries is attributable to the food situation. The breakdown in the morale of the Italian army seems to have been largely caused by an inadequate food supply. The Russian revolution is said by those who appear to be well informed to have been more of a food riot than a predetermined effort to overthrow autocracy. The energies of the Allies are now directed at the reduction of the rations of Germany's civilian population below the level of safety, while she in turn does her utmost to diminish the food supplies of the Allies. It seems clear that the nation or nations which are able to obtain and conserve enough food for the use of their armies and their civilian population, will ultimately be victorious. If this reasoning be correct, surely no more important question can engage the attention of our leaders at this time than that of providing an adequate food supply.

The fundamental factors in modern warfare, stated in the order of their importance, would probably read food, money and men. It would be useless for a nation to start an aggressive war without having first arranged for a varied, abundant and regularly available food supply, suited to the needs of fighting men and to the nourishment of industrial populations called on to perform work of an extraordinary and exhaustive character. The United States, regarded for many years as the granary of the world, has an abundance of food. Much of it is not essential to war purposes, indeed the greater part of it could not be used to advantage in rationing an army. Fortunately, however, all of it is of a character which enables the non-essential to be satisfactorily substituted for the essential. If, therefore, we exercise proper discretion, there is no reason why our own Nation should not be abundantly and properly fed, our armies maintained in good condition and our allies supplied with the surplus of food they must have in order to sustain an aggressive offensive.

If a country does not possess a plentiful supply of money or can not secure large loans from her own people, it is useless for her to undertake so mighty and destructive a task as is participation in a world war. War has been well described as an insatiate monster consuming and destroying without mercy or discrimination all the natural and artificial resources of a country. The present struggle evidences the correctness of this conclusion for the reason that the enormous sums involved are far beyond the appreciation of the average intellect; and yet it appears that we as a Nation are still on the threshold of this great adventure. Therefore, we must have money in abundance, obtained, if possible, through the voluntary savings and economic sacrifices of our own people in respect to the use of food and by taxation on our accumulated wealth which now amounts to $250,000,000,000.

In a nation of 100,000,000 people acting under the selective draft, no difficulty should be experienced in securing enough men successfully to prosecute a war. Of course our recruits in the main are raw and untrained and it will take time to organize and equip them for effective fighting. Nevertheless it is reasonable to suppose that our army will ultimately develop into as great a fighting machine as the world has known. Certainly we shall not fail from lack of resources if we organize our offensive power

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with the genius which has characterized our great industrial and military leaders in the past.

The mobilization of all our Nation's forces is imperatively necessary to success. We can no longer act as individuals. Our patriotic duty is plain. The immediate supervision of our personal views and ideas must ensue in order that the Nation as a cohesive unit may conduct this war against a thoroughly desperate and unregenerate autocracy with vigor, purpose and dispatch. Germany is an empire of blood and iron, whose rulers believe that might is right, that her people represent the salt of the earth and that they do no wrong in crushing or destroying lesser nations through the employment of every foul agency which the human imagination has been able to conjure up out of the mediaevalism of the past or the scientific possibilities of the age in which we live.

The Germans, while prating of God and regarding their Kaiser as His mouthpiece, have cast Christ out of their lives. The milk of human kindness has soured in their breasts. Their government has more completely destroyed the individuality of its people and developed them as a machine-like mass than any other in the world's history. There is no resource at her command which has not been called into play and we witness today the strange spectacle of 70,000,000 people operating as a cooperative entity. Our Nation of 100,000,000 people must correlate all the agencies at its command because our chief opponent can only be chastened and brought to bay by overwhelming display of concentrated force and power.

We possess as great natural resources as any other country. We have great areas yet to be brought under the plow. We have unlimited amounts of iron and coal and great manufacturing enterprises wherewith to fabricate the finished product essential in modern warfare. We have skilled artisans and educated leaders available as a nucleus around which to build a wonderfully powerful and aggressive industrial army. However, it is a gigantic task to mobilize the resources of soil, industry, wealth and manhood and womanhood of a nation which has given no systematic study or consideration to offensive warfare for over 50 years, the citizens of which are naturally a peace-loving people. Moreover, we have enjoyed a greater measure of freedom than has been accorded to those living in other lands and we have lived in greater luxury and ease, we have enjoyed more of the comforts of life and maintained a higher standard of living. It will not be easy to change our customs or abandon our prejudices; yet this is the task we must accomplish if we are to win the war. We must realize that the destiny of the Nation is at stake; we must do voluntarily and willingly what citizens of an autocracy have to do. We who believe in freedom and in liberty must now fight for the retention of the privileges which our flag represents. Therefore, we must be willing to make any necessary sacrifice, whether it pertains to the use of food, to the curtailment of our personal liberty, to the turning over of our wealth to the government, or to the surrender of our men to the army. If we play well our part the outcome is certain.

Among the many questions of pressing importance the maintenance of production of the needful food materials is paramount. These consist at present of wheat, meat, sugar and fats. There is no reason why, if the weather serves, we should not be able materially to increase our wheat crop. By taking thought a few months in advance, the meat supply can also be enlarged. Much of our sugar supply must come from outside

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sources, but we can encourage sugar cane culture in tributary states. As for fats, there are few countries in which a greater variety of fat-yielding crops can be grown to advantage. It would seem as if we ought to be able to meet the exigencies of the situation in the matter of food production, provided we can arouse the patriotic ardor of our people to the point of their cheerful acquiescence in the load they must undertake to carry.

It will avail nothing to raise much and save little. Conservation is production's handmaid, and she asks us not only to grow non-essential foods in abundance but largely to live upon them. The growth and usage of corn, oats and rye enable us to send wheat, meat, fat and sugar to Europe. It is certain that our people will both produce abundantly and conserve as best they can once they understand their duty and responsibilities.

Military efficiency is fundamental to the prosecution of a successful war. Of course a veteran army can not be created in a moment, but our men are hardy, resourceful and devoted to their duty, and such in time will produce an admirable army. When such men, imbued with a high sense of personal honor and inheriting the courage of their forebears, are properly trained and equipped, our future will be safe in their hands. However, our civilian population must be ready and willing to do many things to which it has not been previously accustomed for the sake of the boys in kahki and blue. An army needs many kinds of food and clothing which civilians commonly use. Will we eat more largely of the non-essential foods in order that more of the essentials may be sent abroad? Will we wear old clothes of necessity in order that our boys may be properly clad? Will we by raising money as a people make the more possible their efficient equipment and maintenance? These are pertinent questions and upon their answer will largely depend the force and vigor of our blows against the enemy.

One of our must difficult problems is the attainment of a greater degree of household efficiency. We are a most wasteful people, probably because of the profusion of our natural resources and our great wealth. We have not felt it necessary to save or to deny ourselves anything we have thought to be necessary for our personal comfort and welfare. Our home-makers may teach us how to reduce the cost of living within the required bounds. Students of nutritive values have demonstrated that we can live wisely and well but without waste on much smaller but not less nourishing or desirable rations than we are now consuming. If we practice proper economies in our home we can save much of the money which our Government needs in order to fight a successful war. An average per capita saving of two cents a meal, an economy readily attained, would amount to an annual saving of $2,000,000,000. The pledge card campaign of the Food Administration indicates that millions of our householders are willing and ready to cooperate with the Government in its teaching as to food conservation.

The extension work of our Land-Grant Colleges has already exerted a very helpful influence on the activities of our rural homes. In many instances the men and women county agents have been able completely to transform the point of view of the farmers or householders with whom they have come in contact. The results obtained through this arm of service work, if considered in the aggregate, are truly remarkable. For example,

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Georgia schoolgirls this year put up several million containers filled with fruits and vegetables which otherwise would have been wasted.

As a means of disseminating new information, correcting faulty practices, inspiring rural workers and adding zest to the humdrum duties of everyday farm and home life, the extension divisions are destined to play an important part in the future of our agriculture.

I have said that national efficiency along all lines is the desideratum we must now strive to attain. How shall it be accomplished? First of all, we should make a statistical and economic survey. This has been done in some States. Presumably our Government is well informed in respect to our total resources in food, money and men. We should next institute a food survey in every State that will reach down to the country store, so that we can ascertain definitely the requirements of State and Nation in all staples, whether they are to be used as food or as a source of raw materials for the proper support of our industries. It will not be so difficult to make such a survey because it can be developed on a basis similar to that of the Liberty Loan canvass or the pledge card campaign.

When war seemed imminent and before the Federal Food Administration was established, an endeavor was made in Georgia to present to the people a statistical resumé indicating what we were growing enough of, what we needed to raise in order to be reasonably self-sustaining. Captains were selected from every county and the general plan outlined during a state-wide food production convention. They were asked to organize their communities on the basis of a local food council and to publish data they were provided with in the newspapers. They were asked to cooperate with the men and women county agents and to enlist the aid of the ministers, school teachers, business men and all other agencies in the community in order that the people might be advised as to when, what and why they should plant. As a result of this effort, directed primarily through the College of Agriculture and its extension division, Georgia increased her crops, exclusive of cotton, by at least $150,000,000. An example of the diversity attained is illustrated by the fact that we raised 12,000,000 bushels more corn, 10,000,000 bushels more of velvet beans, several million bushels more of sweet potatoes and peanuts than ever before, and other staple crops in proportion. Georgia is said to be the only State in which the number of hogs increased during the past year, and she has certainly held her own in other forms of animal production. This shows how effective a service may be rendered the Nation through the institution of a food survey and the acquaintance of the people with the needs.

Having now produced the food, the question is how shall it be conserved. The Georgia State College of Agriculture, in cooperation with the Food Administration, took charge of the food enrollment campaign in Georgia. At least 10 percent of our householders will doubtless sign a pledge card and become soldiers of the commissary, thereby making for household efficiency, teaching the doctrine of the clean plate, how to substitute nonessential for essential food materials.

Such military efficiency as the Nation may attain will be due in considerable measure to the work of the Land-Grant Colleges. For many years past they have been training their cadets for military service and there are thousands of graduates of these colleges now acting as officers in the regular, as well as the national army. Some 25,000 young men are

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now enrolled in these colleges, practically all of whom are pursuing the military studies required by law. A considerable proportion of the men in the officers' training camps received their primary instruction in the Land-Grant Colleges. In fact, so great has been the drain on these institutions by reason of the call of the government for college men who are capable of becoming military leaders that the ranks of teachers, research and extension workers have in some instances been decimated. These colleges are a most important national agency. They constitute the reserve out of which the army has obtained and will continue to obtain many of its most valued leaders. They represent our second line of military defense, for the reason that had it not been for the training which they have given to thousands of men now in the national service we would have been much worse off than we are. Yet this service has not been generally appreciated. Possibly now a proper value will be placed on it, perhaps the patient industry of our Land-Grant Colleges will be rewarded by the recognition to which it is entitled for patriotic service assiduously but unostentatiously performed.

These colleges are also the chief sources from which we have obtained our captains of agricultural production. Many of our most progressive farmers received their inspiration and breadth of vision through attendance upon these institutions; most of our agricultural teachers, research and extension men received their fundamental training there. Indeed, the Land-Grant Colleges are responsible through the men they have trained and sent out as leaders for much of what has been accomplished in the last half century along either scientific or constructive lines, as related to the progress, development or stabilization of our farm practice. The same story may be told touching engineering. These Land-Grant Colleges were among the first to establish and encourage instruction in engineering, both from a theoretical and from an applied point of view. Thousands of men have gone out from their walls to engage in practically every art and industry of recognized standing, to whose efforts much of the progress made in industrial fields is due and whose initiative was first called into action as a result of their collegiate training.

The Land-Grant Colleges have been pioneers in teaching household economy and in training women as home-makers. They were among the first institutions to appreciate the value of and to provide for coeducation. Their women graduates, returning to their home communities, have been important factors in securing a change in the point of view with reference to rational nutrition and have helped in the establishment of secondary schools in which home economics has been taught with profit and success. To their activities in large measure is due the general interest now displayed in matters of food conservation. The Land-Grant Colleges also enjoy the distinction of having trained many of our most proficient women county agents, an achievement of which they have reason to be justly proud.

The Nation that would be successful and aggressive must annually train some of its students with a view of maintaining material prosperity. In this respect the Land-Grant Colleges have been outstanding leaders for a quarter of a century. They first undertook to study on a nation-wide basis the economic problems relating to the control of insects and plant diseases. The many remedial measures discovered and reduced to practical application by our experiment stations are now in such common use

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that most people have little or no idea how they acquired the information they possess. For example, consider the use of formaldehyde for the control of smut in oats. This disease, which when uncontrolled causes an average loss of at least 10 percent, can now be virtually mastered for the outlay of a few cents per farm, thus saving millions of dollars annually to the farmer and to mankind. Many equally forceful illustrations could be presented. Institutions which perform such service are important instrumentalities in the conservation and promotion of national welfare.

Our colleges have sought through farm management courses to establish and utilize business methods on our farms. Already the labor income on many types of farms has been ascertained and rapid progress is being made towards inaugurating a sensible and basic system of crop rotation. Investigations have been undertaken through which it is hoped to discover something about what it costs to grow and harvest crops under varying conditions of soil and management. Other equally fundamental questions are being attacked with much vigor. While such work is comparatively new, it has been in progress long enough to show that our whole system of handling and managing land is in many particulars economically wrong. Now that we are entering upon a new phase of world wide competition we must conduct our farms with a reasonable degree of business acumen and not upon the haphazard and indefensible methods of past generations. The pioneering work done by our colleges in this highly specialized field will certainly result in better organization of our farm practice in the near future.

Our colleges have served acceptably in the matters pertaining to rural development. They helped establish, have trained and supplied most of our secondary schools of agriculture with teachers. They have played a generous part in developing the opportunities of the open country by training an acceptable corps of county agricultural agents. They are responsible in many States for the establishment of community clubs which have exercised a leavening and uplifting influence on rural life. They have been active in fostering cooperation, so necessary to the welfare and progress of the farmer. Many grain, cattle and cooperative truckers' associations were originally encouraged or placed on a profitable basis through the help of men sent out from the Land-Grant Colleges. A most important service has been recently performed for our farmers by aiding them to arrive at correct standards for the marketing of their crops, explaining how these crops could be handled on a carload basis to advantage and so distributing them as to insure a reasonable monetary return to the land owner.

The solution of our present and future national problems depends largely on the reorganization of our agriculture and our industries. All thoughtful persons must appreciate this fact. In our farm practice, for instance, machinery must soon largely displace hand labor. This means a complete readjustment of our farming operations. Our industries must be more fully correlated and unified so that greater efficiency in production may be assured at a lower cost. The highest type of leadership will be needed and it is safe to say that the Land-Grant Colleges will be called on to provide their share of these leaders. Judging by past achievements there is every reason to anticipate that they will respond, that they will continue to work aggressively and expand in every legitimate direction with a view of serving State and Nation. The service they have already rendered is of incalculable value. They have justified the wisdom of their

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founder a thousand times over. They stand ready to meet any emergency. Their motto is to serve. They regard sacrifice as a duty, as a privilege, and are imbued with the true spirit of patriotism. They have created out of the raw materal which came to them men of vision and power, and have acquainted them with the fundamental facts essential to the development of leadership. They now look with pride upon their children gone forth by the thousands to meet any destiny which fate may impose with hearts of oak and wills of steel, true and tried, ready to do and die for America, so that order, decency and civilization may constitute the primal asset of generations yet unborn.

THE CHAIRMAN. "A Study of the Requirements for Graduation in Agriculture in the Land-Grant College" will be presented by Dr. C. D. Jarvis of the Federal Bureau of Education. He has made a careful and comprehensive study of this important subject.

A STUDY OF THE REQUIREMENTS FOR GRADUATION IN AGRICULTURE

BY C. D. JARVIS

The present paper represents one phase of a more comprehensive paper on the work of the Colleges of Agriculture which the writer has under preparation for the United States Bureau of Education. The information presented here has been obtained from the several catalogs and from direct correspondence. A statement concerning the work of each institution was prepared and submitted for verification to a representative of the college concerned. The discussions and tabulations are based upon these statements. In general, the catalogs consulted were those announcing courses for the year 1917-18. In some cases, however, the catalogs for this year were not available, but in these the data concerning requirements for admission and graduation have been brought up to date by the officers who verified their respective statements.

I should say in this connection that about five years ago Professor F. B. Jenks, now of the University of Vermont, undertook a similar study while engaged in the Bureau of Education. A preliminary report of his study was made at the Atlanta meeting of this Association (Twenty-sixth Proceedings, pages 108-111). I have used to good advantage the data that have been collected by Professor Jencks, especially from an historic standpoint.

REQUIREMENTS FOR ADMISSION

To appreciate the variations in the requirements for graduation, it is necessary to consider briefly the requirements for admission. During recent years there has been a decided advance among the several agricultural colleges approaching uniform conditions for admission. For the year 1912-13, only 34 of the 50 institutions required a minimum of 14 units for entrance, while at the present time 47 are on this basis. As a result the median requirement for entrance has been raised from 14 in 1912-13 to 15 units in 1917-18. This increase in entrance requirements has been made possible to some extent by substituting vocational subjects for certain academic subjects. This seems to indicate a general liberalizing of college entrance requirements.

While the total unit requirement for admission has been raised, the number of prescribed units has been lowered. The median number of

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prescribed units has fallen from 8½ to 8. By eliminating the institutions requiring less than 14 units, there is a difference of one unit. With the lowering of the number of prescribed units, there follows a corresponding increase in the number of optional units. There has been a marked liberalization also in the number of optional units that may be offered for vocational subjects. Table 1 shows that in 23 institutions there is practically no limit to the number, and in 15 other institutions at least four units may be offered in vocational subjects.

As shown in table 1, it is a common practice to admit conditionally students who are unable to meet all the requirements. Of the institutions requiring 14 units or more for admission only two, Maine[1] and Pennsylvania, distinctly state that students are not admitted with "conditions." Colorado, also, may be included in this category, for such of their applicants who are unable fully to meet entrance requirements are required to register for their three-year curriculum or "school of agriculture." Two others, Indiana and New Hampshire, state that students who are deficient in any of the requirements are admitted only in exceptional cases. The three institutions, Mississippi, North Carolina and South Carolina, that require less than 14 units for entrance, generally do not admit students with conditions, but Mississippi approves one unit condition in geometry. In at least nine cases—Georgia, Hawaii, Illinois, Michigan, Minnesota, New York, Oregon, Utah and Wisconsin—the practice is to admit students who meet the total requirements but who may be deficient in some of the prescribed work. In two of these cases—Georgia and Wisconsin—deficiency in foreign language only is approved. In Hawaii, students deficient only in physics and in Illinois, students deficient only in one unit of science, are admitted conditionally.

It is remarkable that some institutions approve of "conditions" only in prescribed subjects while others approve of them only in non-prescribed or optional subjects. Since the subjects prescribed for admission are those that are regarded as prerequisite to collegiate courses, it would seem that these subjects invariably should be required for admission. If this is not the real purpose of such a requirement, the practice of specifying certain subjects in making up the total requirements seems quite arbitrary.

Although 10 institutions have no fixed time limit for the removal of entrance conditions, the general practice is to require students to make up all entrance deficiencies within one or two years. In one institution, Nebraska, the time limit is one semester; in 23 institutions it is one year; in six institutions it is two years; and in two institutions—Massachusetts and Utah—the limit is four years or any time before graduation.

When it is understood that in most institutions the minimum requirement for graduation is fixed at a point approximating the maximum amount of work that the normal student can complete within the given time of four years, it is obvious that a student entering with a handicap of two or three units, equal to 20 to 30 semester hours, is likely to remain deficient even at graduation. With the limited information available, it is impossible to determine the proportion of conditioned students who require more than four years for graduation, but the belief is that it is remarkably small. Such students even though they may have passed all required examinations are not likely to be as well prepared in collegiate subjects as

[1] For convenience the name of the State is used instead of the name of the Land-Grant College of the State.

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those who entered college without such a handicap. If, in some institutions, this is not the case, it may be assumed that the minimum requirements for graduation are too low and that the normal student is not making the best use of his time. It is well known, of course, that there is a great difference in students with regard to the amount of work that may be carried successfully, but the exceptionally capable students are not usually found among those who enter with conditions.

Owing to the gradual introduction of vocational courses into the high schools, there is bound to be much irregularity of preparation during the next few years. Much of the technical work now given during the first year or two in college eventually will be given in the secondary school, and the agricultural colleges during the next few years will be required to adjust their curricula to conform to the gradual modification of those of the high school. This should not be a difficult problem, but during the transition stage it will necessitate considerable duplication of work. Even now many colleges find it necessary to offer certain technical courses, like sewing and cooking, that have come to be regarded as secondary school courses. In the near future such courses as plant propagation, elementary field and forage crops, types and breeds of livestock, elementary soils, etc., may be regarded in the same way, but for the benefit of the students who have not had such courses, the colleges also will need to offer them.

The vocationalizing of high schools may necessitate also the establishment of liberal standards of preparation that may be invariably enforced. The prescribed work in such standards it seems should require preparation in such subjects as are believed to be prerequisite to collegiate courses and the optional work may include satisfactory preparation in any secondary school subject. It may be desirable to classify the optional subjects, as it is sometimes done now, and to require a certain proportion from each group according to the general needs of the curriculum selected. In other words, the secondary school should be expected to prepare the student in a general way for his chosen vocation.

Requirements for Graduation

Basis of collegiate credit

In comparing the requirements for graduation, it is imperative first to adopt a common basis for measuring collegiate requirements. There is considerable variation among the institutions concerning the basis upon which credit is allowed.

In the first place, some institutions maintain longer yearly sessions than others. Most of the institutions, however, maintain sessions of 36 weeks each. The only exceptions are Alabama and Florida whose sessions are 40 and 32 weeks respectively. Since so little variation exists in this respect, no adjustment has seemed necessary. The total requirements for graduation, however, are increased by one-thirty-sixth for each week in excess and reduced in the same proportion for each week less than the normal number.

Secondly, the institutions vary with regard to the number of terms in each session and this is responsible for a variation in the value of the credit unit. In 40 institutions, the session is divided into two terms or semesters. In these institutions, one hour of class work per week, or its equivalent, for one semester is the credit unit. In 10 institutions the

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session is divided into three terms and the unit of credit usually is one hour of class work per week, or its equivalent, for one term. A term-hour credit, therefore, is only two-thirds the value of a semester-hour credit. Correction on this basis has been made in the tables of comparison.

Some exceptions should be noted to the practice of awarding credit on the term-hour and semester-hour bases. In Georgia the unit of credit is the year-hour, or one hour of class work per week or its equivalent for one session. In Utah, although the session is divided into three terms, the unit of credit is the semester-hour. In Massachusetts, the year's work is divided into four terms, the fourth comes in the summer and, therefore, does not affect the awarding of credit on the basis of term-hours. Similarly in New York, the year is divided into three terms, the third comes in the summer, and therefore does not affect the awarding of credit on the basis of semester-hours.

Although generally spoken of as an "hour," the recitation period in most institutions is of 50 minutes' duration. There are four exceptions to this rule. Alabama and Montana each maintain 60-minute recitation periods, and New Jersey and Ohio each maintain 55-minute periods. No adjustment has been made to make correction for this variation. These differences, however, should be kept in mind when making comparisons.

The most significant variation in the value of credit units is found in the different amounts of laboratory and field work required as equivalent to class room work. In general, one credit hour implies three actual hours of effort on the part of the student. Some institutions conscientiously insist upon this rule. In order to make allowance for the peculiarities of the various courses, they require varying amounts of time in attendance at class or in laboratory. In courses like drawing or shop work, for example, requiring no outside preparation, they demand three actual hours' attendance for each credit. For other courses, like physics, requiring only a small amount of outside preparation, they demand two hours of attendance at class; and for courses, like English literature, requiring much outside preparation, they require only one hour in attendance at class.

Apparently many institutions, for the sake of convenience, are anxious to maintain a plan for awarding credit that will permit of uniform credit for each kind of class exercise, whether recitation or practicum, rather than one that will permit of uniformity for each subject. There are bound to be inaccuracies in either case, for more depends upon the exacting requirements of the individual instructor than upon any arbitrary standard based upon class attendance.

Table 4 shows that 20 of the institutions uniformly require two hours of laboratory work for each credit hour. These institutions may or may not require students to spend some time in preparation for this work. Two institutions uniformly require two and one-half hours as the laboratory equivalent, 10 uniformly require three hours and 15 require varying amounts ranging from two to three hours. In three institutions there is no differentiation of credit between recitation hours and laboratory hours. In many of the institutions requiring varying laboratory equivalents, two hours is the normal requirement and excess time required only in certain courses like shop work and military drill. As a basis of comparison, therefore, the two-hour laboratory equivalent has been adopted in this discussion. At best, this is a mere arbitrary standard and does not warrant absolute dependence, but undoubtedly it is more dependable than the use of college credits without adjustment.

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In comparing requirements for graduation in a curriculum like that of agriculture, which affords opportunity for specialization in many phases of the subject, it is quite necessary to restrict attention to one special line or major option. For the present discussion the agronomy or field crops option has been selected. In the few cases where no such option is offered, some other option has been selected. In some institutions a liberal elective system takes the place of the major option plan and in each of these an approved combination of courses suitable for students specializing in agronomy has been used.

TOTAL REQUIREMENTS

The total requirements for graduation for the several institutions is shown in table 4. In the second column of the table is shown the requirement of each college according to the institution's method of awarding credit. The figures range from 79 as required by Georgia to 468 as required by Virginia. The varying number of terms in each college year and the varying practice with regard to the laboratory work equivalents are the chief causes for the conspicuous variation in credit requirements. It is apparent, therefore, that the requirements for graduation as expressed in terms of college credit are not comparable.

In the third column of the table are shown the total requirements in semester-hours. Correction in this case has been made on the basis that two hours of laboratory work are equivalent to one hour of lecture or recitation work. The totals vary from 124 semester-hours, as required by Missouri, to 228 semester-hours, as required by Virginia. The median total requirement, as shown at the bottom of the table, is 157 semester-hours. The median number is based upon the frequency of occurrence of the various requirements; that is, in this case, 25 colleges have a total requirement of 157 hours, or more, and 25 others have a total requirement of 157 hours or less.

Since the amount of work required for graduation depends more upon the institution's standard of proficiency than upon the number of hours required in attendance at class, the figures representing total requirements have very little meaning. For example, students who have completed the 228 semester-hours required by Virginia may not be any better equipped than those who have graduated from Missouri with its minimum requirement of 124 semester-hours. The value of an analysis of this kind, therefore, is not found in a comparison of total requirements so much as in a comparison of the proportional requirements in the various subjects included in the curriculum.

DISTRIBUTION OF WORK REQUIRED FOR GRADUATION

Table 4 shows the proportion of the work required in various groups of subjects. The subject classification employed here is quite arbitrary but it is similar to that commonly followed in agricultural college circles. Under non-technical subjects are included courses in English, public speaking, journalism, library practice, foreign language, mathematics, history, civics, economics, sociology, psychology and education. Under science are included not only the pure science courses but those relating directly to agriculture, such as agricultural chemistry, agricultural botany, soil bacteriology, plant pathology, economic entomology, etc. Under technical subjects are included not only strictly agricultural courses but those per-

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taining to agricultural engineering, farm mechanics, drawing, farm machinery and veterinary science. On account of the instruction being given usually in the technical departments, courses in genetics, farm management and cost accounting are classed as technical. Military and physical training, on account of their close association, are group together. Personal hygience and human physiology, being regarded as physical education, are included.

The proportion of work required in each group of subjects is shown on a percentage basis. To make allowance for varying amounts of elective work, it may be desirable, in the case of an institution showing a high proportion of elective work, to raise slightly the proportion of work required in each group of subjects. The conspicuous feature of this table is the wide variation in the requirements of the various groups. In nontechnical subjects the range is from 6 to 34 percent and the median percentage, as shown at the foot of the table, is 15. The institutions requiring the higher proportions are Massachusetts, Maryland, New Jersey, South Carolina, Rhode Island and Tennessee, while those requiring the lower proportions are Idaho, New Mexico, Kansas, Louisiana, Nevada and Ohio. The institutions more nearly approaching the median requirement are those in Arkansas, Colorado, Connecticut, Georgia, California, Illinois, New York and Texas. The first four call for exactly the median number.

In science the range is from 20 to 47 percent and the median percentage is 30. The institutions showing the higher proportions in science are those in New York, California, Hawaii, Montana, Nebraska, New Jersey, North Dakota and West Virginia. The lower proportions in this subject group are found in Porto Rico, Louisiana, Vermont, Georgia, Michigan and Massachusetts. The following institutions require exactly the median proportion: Arkansas, Iowa, Minnesota, Ohio and Oregon. Many others closely approach the median.

In technical subjects the range is from 15 to 53 percent and the median percentage is 37. The institutions showing the higher proportions are Porto Rico, Oklahoma, New Mexico, Louisiana and Texas. Those showing the lower proportions are Utah, Massachusetts, South Dakota, Hawaii and Washington. Those requiring the median proportion, or approximately so, are Maryland, Ohio, Pennsylvania, Florida, Maine, Nevada and South Carolina.

In military and physical training the range is from 3 to 11 percent and the median percentage is 5.

Since the percentage of elective work indicated in the table represents only the amount that remains after satisfying the requirements for specialization in the major subject, it is unsafe to place full dependence upon the figures shown in the last column. In the Cornell curriculum, for example, the table shows no elective work while, in reality, the work of the last two years is wholly elective under the limitations of the advisory system. The outline in this case includes all required work and a selected number of courses recommended for students specializing in farm crops. In most of the institutions in which a liberal elective system takes the place of the major option plan, a similar adjustment has been made. In a few other institutions the suggested curriculum in each major option is somewhat elastic and in these it is possible for students to select a combination of courses which may show proportions quite different from those shown in the table. On the whole, however, the proportionate distribution is

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fairly accurate and represents the belief and the practice of the several institutions.

The distribution of the requirements for graduation according to the year in which the work is offered is shown in table 5. In this table the non-technical work is shown in four divisions, namely: English, modern language, mathematics and social science. The technical work, also, is divided and shown in two classes, namely: technical agriculture and agricultural engineering. The subjects included in each of these groups are indicated in the footnotes to the table. The table shows the number of colleges offering work in each subject group in each of the four years and for all four years combined. It also shows, in semester-hours, the range of the requirements and the median requirements for each group of subjects offered each year and for all years combined. The institutions requiring no work in any particular subject in any given year were not considered in making up the median requirements in each case. The median number, therefore, represents the median practice of only the institutions requiring work in the subject in question.

Since the table speaks for itself, special attention is called only to a few of its more conspicuous features. Referring to the lower part of the table, first column, all colleges require English and the amount varies from 4 to 24 hours, the median requirement being 10 hours. The number of colleges requiring English decreases from 49 in the freshman year to 6 in the senior year.

In the lower part of the second column is shown that 20 institutions require modern language and the amount varies from 4 to 20 hours with a median requirement of 12 hours. The work is offered generally in the first two years, but five institutions require it in the junior year and four require it in the senior year.

Thirty-two institutions require mathematics ranging in amount from 1 to 13 hours with a median requirement of 5 hours. All but six of these institutions require the work in this subject during the freshman year.

Work in social science consists largely of economics which is pre-eminently an upper-class subject, as shown in the fourth column. The work under this head required by 12 colleges in the freshman year consists largely of history and civil government.

The total amount of work in non-technical subjects ranges from 10 to 61 hours with a median requirement of 23 hours. This wide variation is not due to differences in entrance requirements, as might be expected, for the institutions requiring the most work in non-technical subjects are not those admitting students with less than 14 entrance units. It is true, however, that the institutions with low entrance requirements require relatively high proportions of work in non-technical subjects.

A glance at column six shows plainly the great difference in the amount of science required in the freshman year. The range is from 3 to 24½ hours and the median amount is 15½ hours. Eight institutions require 20 hours or more of science in the first year and three of these drop to about half that amount in the second year. One institution, calling for but three hours during the freshman year, calls for 28 hours in the sophomore year. The curriculum in each of several institutions calls for three or four heavy science courses during the same year. One curriculum, for example, calls for 10 hours in chemistry, 8 hours in botany and 6 hours in bacteriology in the freshman year. Another calls for 8 hours in botany, 5

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hours in zoology, 13 hours in chemistry and 6 hours in physics during the sophomore year. In this same institution the science requirements for the four years are 8 hours, 32 hours, 17 hours and 5 hours, respectively.

The science requirements for the sophomore, junior and senior years show about the same range. The median requirement, however, gradually decreases from 18 hours in the sophomore year to 6 in the senior year. In the senior year, on account of the proportion of elective work being generally higher, the median requirement in science, as well as in the other subject groups, is obviously lower than is likely to be the case in actual practice.

General botany and general chemistry are preeminently freshman subjects. In 29 institutions a greater part of the work in general botany is required in the freshman year and in 41 institutions a greater part of the work in general chemistry is required in the freshman year. In 15 institutions general botany is regarded as a sophomore subject and in eight general chemistry is regarded as a sophomore subject.

In 10 institutions zoology is regarded as a freshman, in 25 as a sophomore and in 6 as a junior subject. Most of the institutions requiring entomology look upon it either as a sophomore or junior subject. Qualitative analysis is quite generally regarded as a sophomore subject although 5 institutions require it in the freshman year and 4 require it in the junior year. Of the 19 institutions requiring quantitative analysis, one requires it in the freshman year, 8 in the sophomore, 8 in the junior and 2 in the senior year. Of the 30 institutions requiring organic chemistry, one call for it in the freshman year, 19 in the sophomore, 8 in the junior and 2 in the senior year. Agricultural chemistry is more commonly required in the sophomore or junior years. Of the 33 institutions requiring physics, 11 require it in the freshman year, 18 in the sophomore and 4 in the junior year. Of the 27 institutions requiring geology, one requires it in the freshman year, 12 in the sophomore, 7 in the junior, 4 in the senior year and 3 in two or more years.

All but eight institutions require some work in technical agriculture during the freshman year. Six of these require work in subjects classed as agricultural engineering. The range of all required technical work in the freshman year is from 2 to 24 hours and the median requirement is 10 hours. Three institutions require no technical agriculture in the sophomore year, but each of these requires some work in either drawing or farm mechanics. The requirements in all technical subjects range from 3 to 29½ hours, with a median requirement of 12 hours. All institutions require agriculture in the junior and senior years. In the junior year the range is from 2 to 30 hours and the median requirement is 15 hours. In the senior year the range is from 2½ to 34 hours and the median requirement is 18 hours.

The total requirement in technical work for all four years varies from 21 to 90 hours with a median requirement of 60 hours.

There are a number of technical courses that are commonly given in the freshman year. Work in stock judging, or the study of types and breeds of livestock, is required in the freshman year by 33 institutions. Work in field or forage crops or in judging and testing grain is required in the freshman year by 19 institutions. Sixteen institutions require work in farm mechanics, 15 in drawing, 12 in dairying, 9 in plant propagation, 8 in general agriculture and 5 in farm machinery. Among the unusual

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technical subjects required in the freshman year may be mentioned the following: soils, required only by one institution; feeds and feeding, required by two institutions; animal breeding, one institution; forestry, two institutions; fruit growing, three institutions; vegetable growing, four institutions; poultry husbandry, three institutions.

The technical subjects more commonly required in the sophomore year are the following: soils, required by 27 institutions; field or forage crops, 22 institutions; stock judging or the study of breeds, 18 institutions; fruit growing, 14 institutions; surveying, 11 institutions; general horticulture, 10 institutions; vegetable gardening and farm machinery, each required by 8 institutions.

For the junior or senior years, the technical courses more commonly required relate directly to the subject of specialization. There are certain courses, however, that are generally required of all students and that are usually regarded as upper-class subjects. Among these, genetics and farm management are the most conspicuous. While several institutions require these courses in the junior year, they are more often required in the senior year.

All institutions, except Hawaii, require military or physical training in the freshman and sophomore years; and 17 institutions require it in the junior and 10 in the senior year. The amount of this work required throughout the 4 years varies from 2 to 24 hours with a median requirement of 8 hours.

In general the opportunity for election is limited to the junior or senior years. Some opportunity for election, however, is offered by 6 institutions during the freshman and by 11 institutions during the sophomore year. A few other institutions offer an opportunity for substitution for one or more courses during the first two years.

It may be observed that the median requirement in technical work increases from year to year while that in science decreases. The median requirement in non-technical subjects is high for the freshman year, but remains constant for the last three years.

There is considerable variation in practice concerning the total amount of work required during each year. In the freshman year the range is from 24 to 57 hours with a median requirement of 41 hours; in the sophomore year from 32 to 57 hours with the same median requirement; in the junior year from 29 to 57 hours with a median of 38 hours; and in the senior year it is about the same and the median requirement slightly lower.

QUESTIONS SUGGESTED BY THE STUDY

The present study has suggested many questions of which the following seem worthy of special mention:

1. Is it desirable to encourage uniform entrance requirements among the Land-Grant Colleges?

2. Is it not possible to modify specific requirements for admission in such a way as to obviate the necessity of admitting students with conditions?

3. Wherein is the necessity for prescribing certain subjects for admission beyond those regarded as prerequisite to college work?

4. Is it not desirable to encourage uniformity in the matter of awarding college credit?

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5. Is there as much difference in the amount of work required for graduation as the credit requirements of the several institutions seem to indicate?

6. Are there good reasons for the great difference in practice with regard to the proportion of prescribed and elective work required for graduation?

7. Are there good reasons for the great variation in the requirements for work in the various groups of subjects?

8. In what proportion should the requirements for graduation be distributed among the various subject groups?

9. Is it desirable to require a larger proportion of technical work during the freshman and sophomore years?

TABLE 1. GENERAL ENTRANCE REQUIREMENTS

	Number of colleges
Age:	
16 years	24
15 years	2
14 years	2
No age limit	22
Farm experience:	
Before or after entering	17
Entrance units:	
16 units	2
15 units	30
14½ units	2
14 units	12
13 units	0
12 units	2
11 units	1
Number of prescribed units:	
5 or less	4
5½-6 prescribed	6
6½-7 prescribed	8
7½-8 prescribed	8
8½-9 prescribed	10
9½-10 prescribed	10
10½ prescribed	2
Vocational units accepted:	
Unlimited number	23
Not more than 5	1
Not more than 4	14
Not more than 3	4
Not more than 2	4
Not more than 1	2
Conditions approved:	
3 units	1
2 units	22
1 unit	15
0 unit	5
Number unstated	5
Time for removal of conditions:	
½ year	1
1 year	25
2 years	7
3 years	0
4 years	2
Unstated time	8

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TABLE 2. PRESCRIBED WORK FOR ENTRANCE

	Number of colleges		Number of colleges
English	48	History or Social Science	48
4 units	2	2 units	8
3 units	42	1 unit	28
2 units	4	0 unit	12
Modern language	17	Science (including Physics)	33
3 units	2	3 units	2
2 units	15	2 units	5
1 unit	0	1 unit	26
0 unit	31	0 unit	15
Mathematics	48	Physics	9
3½ units	2	1 unit	9
3 units	3	0 unit	39
2½ units	16	Agriculture	1
2 units	26	1 unit	1
1½ units	0	0 unit	47
1 unit	1		

TABLE 3. COMPARING PRESENT REQUIREMENTS WITH THOSE OF 1912-13

	Requirement for admission				Requirement for graduation	
	Total units		Prescribed units		Credit hours	Credit hours
	1912-13	1917-18	1912-13	1917-18	1912-13	1917-18
Maximum	15	16	12	10½	216	228
Minimum	4	11	3	4	120	120
Median	14	15	8½	8	154	146

TABLE 4. PERCENTAGE REQUIREMENTS FOR GRADUATION

	One-credit Laboratory period	College credit	Semester-hours	Non-technical subjects	Science subjects	Technical subjects	Military and physical training	Electives
	Hours			%	%	%	%	%
Alabama Polytechnic Institute	1	388*	193	24	32	34	7	3
University of Arizona	3	124	138	24	31	30	4	11
University of Arkansas	2-3	138	151	15	30	42	5	8
University of California	2-3	130	149	16	37	33	8	6†
Colorado Agricultural College	2	160	160	15	34	31	5	15
Connecticut Agricultural College	2	150	150	15	26	27	9	23†
Delaware College	2	150	150	22	31	29	9	8
University of Florida	2	132	132	17	32	38	3	10
Georgia State College of Agriculture	2	79‡	158	15	23	42	5	15

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Table Four—Continued

	One-credit Laboratory period	College credit	Semester-hours	Non-technical subjects	Science subjects	Technical subjects	Military and physical training	Electives
College of Hawaii.....	2-3	136	147	22	37	26	0	14
University of Idaho.....	3	142	164	6	36	34	5	20
University of Illinois.....	2-3	130	155	14	28	42	5	11†
Purdue University, Indiana	3	169	194	22	34	41	3	0
Iowa State College.....	3	143	175	10	30	45	3	11
Kansas State Agricultural College	3	136	157	8	27	46	4	15
University of Kentucky..	2	145	145	9	27	42	7	15
Louisiana State University	3	136	158	8	22	48	6	17†
University of Maine.....	2-3	150	159	13	31	36	6	15
Maryland State College of Agriculture	2	318*	212	29	29	37	6	0
Massachusetts Agricultural College	2	220*	150	34	25	17	9	15
Michigan Agricultural College	2-3	240*	170	11	24	31	5	29
University of Minnesota..	2-3	144	160	17	30	40	3	10
Mississippi Agricultural and Mechanical College.	2	292*	195	18	29	39	6	7
University of Missouri....	2	124	124	9	36	34	3	19
Montana State College....	2-2½	150	161	11	37	40	3	10
University of Nebraska...	3	125	154	12	37	31	4	16†
University of Nevada.....	2½	148	160	8	28	38	3	23
New Hampshire College of Agriculture and Mechanic Arts	2½	144	155	11	31	43	5	10
Rutgers College, New Jersey	2-3	146	165	29	37	30	4	0
New Mexico College of Agriculture and Mechanic Arts	2	150	150	7	33	49	7	4
Cornell University, New York	2½-3	120	139	14	47	35	4	0†
North Carolina College of Agriculture and Engineering	2	182	182	23	29	41	4	3
North Dakota Agricultural College	2	225*	150	10	37	44	5	4
Ohio State University....	3	142	155	8	30	37	5	20
Oklahoma Agricultural and Mechanical College	3	134	156	10	28	50	6	7
Oregon Agricultural College	2-3	136	162	10	30	42	11	6
Pennsylvania State College	2-2½	160	169	24	29	37	5	5
University of Porto Rico.	2	170	170	11	20	53	7	9
Rhode Island State College	2	179	179	27	26	30	7	11
Clemson Agricultural College, South Carolina...	1	360*	180	29	27	36	8	0
South Dakota State College	2-2½	146	178	22	32	22	4	20
University of Tennessee..	2	140	140	26	28	39	7	0
Agricultural and Mechanical College of Texas..	2	162	162	16	29	48	7	0
Agricultural College of Utah	2½-3	132	146	19	34	15	10	22†
University of Vermont...	2	152	152	24	22	47	7	0
Virginia Polytechnic Institute	1	468*	228	23	32	35	11	0
State College of Washington	2	154	154	26	25	26	4	19
West Virginia University.	2-3	144	163	12	37	34	5	13
University of Wisconsin..	2	143	143	17	32	28	6	18†
University of Wyoming..	3	126	151	11	33	32	6	19
Median number			157	15	30	37	5	12

*Term hours.

†The work of the upper classmen is largely elective and this number represents only the elective work that remains after satisfying the requirements for specialization in agronomy or field crops.

‡Year hours.

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TABLE 5. DISTRIBUTION OF WORK FOR GRADUATION

	Non-technical subjects						Technical subjects					
	English (a)	Modern language	Mathematics	Social science (b)	All non-technical	Science (c)	Technical agriculture (d)	Agricultural Engineering (e)	All technical	Military and physical training (f)	Elective	All subjects
Freshman year												
Number of colleges.....	49	15	28	12	50	50	42	32	48	49	6	50
Maximum hours	11	8	12	6	26	24½	20	14	24	7	12	57
Minimum hours	4	4	3	½	3	3	1	1	2	2	2	34
Median hours	6	6	6	3	12	15½	8½	4	10	4	4	41
Sophomore year												
Number of colleges.....	29	13	6	5	38	50	47	18	50	48	11	50
Maximum hours	6	8	6	9	15	32	26	12	29½	7	13	57
Minimum hours	2	4	1	3	1	9	2	1	3	2	2	32
Median hours	4	6	4½	6	6	18	12	3	12	3	6½	41
Junior year												
Number of colleges.....	16	5	0	28	36	46	50	22	50	17	32	50
Maximum hours	6	10	..	12	15	24	30	12	30	6	30	57
Minimum hours	1	3	..	2	1	3	2	2	2	2	1	29
Median hours	4	5	..	5	6	12	14½	4	15	3	7	38
Senior year												
Number of colleges.....	6	4	0	32	33	32	50	19	50	10	40	50
Maximum hours	5	10	..	10	15	20	28	7	34	6	24	57
Minimum hours	2	2	..	2	2	3	2½	1	2½	2	4	27
Median hours	4	7	..	6	6	6	17½	4	18	3	11½	37
All years												
Number of colleges.....	50	20	32	45	50	50	50	44	50	49	41	50
Maximum hours	24	20	13	23	61	73	78	21	90	24	50	223
Minimum hours	4	4	1	3	10	34	21	3	21	4	5½	124
Median hours	10	12	5	8	23	48	51	9	60	8	20	157

(*a*) Includes literature, composition, rhetoric, argumentation, public speaking, journalism and library practice.
(*b*) Includes history, civil government, economics, sociology and education.
(*c*) Includes, in addition to pure science courses, all science subjects closely related to agriculture, such as agricultural chemistry, economic entomology, etc.
(*d*) Includes veterinary subjects in addition to the strictly agricultural subjects.
(*e*) Includes drawing, shop work, surveying, irrigation, drainage, farm structures and farm equipment.
(*f*) Courses in personal hygiene and human physiology are classed under physical training.

W. E. STONE. A word with reference to entrance requirements.

We cannot expect to set up uniform entrance requirements where public school conditions vary as they do in the different States. Tax-supported institutions must adjust their entrance requirements to the standards and the achievement of the secondary schools in their respective States. Institutions in the Western States cannot enforce the same entrance requirements as those in the Eastern States because the public school conditions are quite different.

Most of our colleges now fix their entrance requirements at 15 units. But the detail to be covered in these 15 units must, of course, be related to the curricula of our high schools. Fortunately, we conform to the standards set up in the report of the Committee of Fifteen of the National Educational Association, which has been adopted by our State Board of Education as the standard of performance for the high schools in Indiana. In

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effect, therefore, Purdue University has not much choice in fixing its entrance requirements unless we decide to ignore the work of the schools of our State, which, of course, we can not and ought not to do. In each State, therefore, our institutions must take into account the standards already set up for their high schools and adjust their entrance requirements accordingly.

C. D. JARVIS. I do not wish it understood that I am advocating an increase in the entrance requirements in any institution. The institutions themselves are the best judges of this matter. The conditions surrounding them are oftentimes such that an increase in entrance requirements would not be conducive to the best results. I simply raised the question for purposes of discussion.

HOWARD EDWARDS of Rhode Island. With regard to one question that was asked there seems to be an implication that the situation was an illogical one, and that is with regard to required subjects that are not preliminary to other subjects in the college course.

Sometimes, in the minds of teachers, it has been thought necessary for the graduate of the institution to have certain knowledge on a given subject—for instance, modern language. We recently changed our course so as to omit modern language from the studies of those persons taking the Reserve Officers' Training Course. In order to see to it that some modern language was had by all students, we put two years of modern language in the entrance requirements among the required subjects. It seems to me that is quite proper, and perhaps necessary.

THE CHAIRMAN. The Chair is impressed by the immense amount of work necessary to prepare this paper, the length of time and the precision that is required not to go counter to that book of the Medes and Persians called the college catalog.

HOWARD EDWARDS. The point I was trying to make was not whether the work should be in the college course or not, but whether it was logical to list some subject as required in the entrance class when it did not lead to something in the college course. We make, usually, two classes of entrance subjects—those that are required and those which are elective, a considerable list from which a sufficient number of units are chosen to make in conjunction with the required units the total requisite number. Now, I understood one of your questions to be, "Why should required subjects be listed among the entrance requirements if they do not lead to something in the college course itself? I simply wish to indicate that in our particular case the idea was to see to it that certain subjects were pursued either during the four years of the high-school course or during the four years of the college course.

C. D. JARVIS. A difference of opinion exists as to what constitutes a prerequisite to a college course. A good many people regard foreign language as a prerequisite course to college work, and rightly so in certain curricula. There evidently is a difference of opinion, however, among the Land-Grant Colleges, because only 17 institutions require foreign language in their college courses, and 23 of them require it neither for entrance nor for graduation. This goes to show that foreign language is not regarded always as a prerequisite to collegiate work in agriculture. The

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course of study committee in the several institutions should determine, I presume, what courses are prerequisite to college curricula.

As a prescribed course, foreign language is the most conspicuous example among those that are questionable. It is a question of relative values—whether one subject is better than another. Why should an institution specify so many units in English, so many units in foreign language, and so many units in mathematics, unless the study of those subjects represents, without doubt, the best use of the student's time? You may say, of course, that all secondary subjects are prerequisite to a general education, that is to say, that they may be regarded as prerequisite from the disciplinarian point of view. Even then there is reasonable doubt as to whether one subject is better than another.

R. W. THATCHER of Minnesota. The point raised by President Edwards brings up a question of fundamental importance. An entrance requirement is a subject without which a student is not permitted to enter a college. We assume that our colleges are a part of the state educational systems. Have we a right, then, to say that any considerable proportion of high-school graduates shall not enter our colleges if they have not studied modern language for two years? It seems to me that we take a wrong attitude towards the educational system if we say, with reference to modern languages as an example, that we believe that the student must learn them. We propose not to teach them ourselves on the one hand, but we propose not to allow any students to enter our colleges unless they have received such instruction in the high-school. This is equivalent to saying that the high-schools must teach certain subjects in order that their graduates may enter our colleges. I am not quite sure that we are still in that stage of opinion as to our function as colleges.

HOWARD EDWARDS. I am sorry that apparently I cannot make myself understood. I have not wished to discuss the question of whether modern languages should or should not be required in one place or another, or whether they should be required at all. I was simply trying to point out that in the opinion of college faculties it might be necessary to relegate to the high-school a subject regarded as important, indeed as necessary, to specify it as a required entrance subject, and that it was not an illogical position on our part even when there was nothing to be superimposed upon it.

Incidentally, I might explain that when the Reserve Officers' Training Corps was specifically placed as a requirement upon the Land-Grant Colleges, and upon us in particular, we had to consider two classes of people—those who elect the Reserve Officers' Training Corps work in their junior and senior years, and, therefore, take the five hours of work specified, and those who do not elect it and, consequently, take a somewhat different course. Our work was arranged at that time without reference to this special and new requirement. Now, when we endeavor to put those two things together, something has to be omitted from the curriculum of those students taking the Reserve Officers' Training Corps work. After careful consideration we eliminated certain studies—among others, modern language—for the reason that these seemed to be most easily relegated to the realm of the secondary school.

R. W. THATCHER. Perhaps I ought to explain that I also used modern

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language only as an example. I might have chosen some other subject, or an unknown subject, X. The question I wanted to raise was whether, in the case of any subject, as X, we have a right to say that students who have not studied X during their high school days, who, nevertheless, have completed a four-year's high school course, cannot enter our college.

F. B. JENKS of Vermont. When you specify any subject, no matter what it is, you get into difficulty, because the high-schools as a class do not offer very many subjects that are common to all such schools.

In the State of Massachusetts I found, eight years ago in looking over the situation, that only two subjects, English and algebra, were taught which were common to all the high-schools of that State. I do not know what the present situation is in this respect. Whenever any college says that certain things must be taught in the high-school, unless it be English or mathematics, it is apt to impose a hardship on some high-schools. Either they must change their curricula or fail to fit their students for college. So that we find that people differ in their ideas as to what ought to be taught in high-schools as well as in colleges.

ALFRED VIVIAN of Ohio. It might be a good idea for all the state legislatures to do what the Ohio legislature has done, namely, pass a law requiring State Universities to admit all graduates of first-grade high schools regardless of what courses they pursued. I may say that we looked askance at that law when it was passed, but I believe I might be almost safe in saying that we would not care to have it changed now if we could. It really has worked out very well.

The regular high schools are always rated by the State Superintendent of Public Instruction. He has a very competent corps of high school inspectors, including men from Ohio State, Miami and Ohio University, all of them state-supported institutions. Upon the reports of their inspection, he rates the high schools as first-, second- and third-grades. We have to admit graduates from all schools that he rates as first-grade, offering 16 units of work. About one-third of all the high schools, and about three-quarters of the four-year high schools, are rated as first-grade.

HOWARD EDWARDS. Are you required to admit graduates of commercial courses, etc., on a par with graduates of classical courses?

ALFRED VIVIAN. We have to admit them if they have completed a four-year course in a high school which has been graded as first-grade by the superintendent.

W. M. RIGGS. Speaking for the extreme Southern States, the greatest difficulty is in finding the requisite units in any subjects that the schools teach. We go to great lengths to accept almost any kind of a subject that looks at all like a unit.

I regard the matter of entrance requirements as secondary to exit requirements. Since the institution of the empirical Carnegie unit scale, I think we have stressed too much the entrance rather than the exit to college training. In my native State—and I assume this condition is rather general throughout the South—there is a great deal of pretence as to admission standards and too little performance in enforcing them. It would be practically impossible for any of our colleges to fill their freshman

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classes if they excluded from the count any of the units which the schools claim to furnish.

Of course in the South we have labored under the difficulty of maintaining a dual system of schools—one for the whites and one for the negroes—and that has divided our funds, with the result that neither system is as efficient as it should be.

Colleges need to be concerned more with internal conditions than with external conditions, and to make standards after a student enters so that he will be subjected to a reasonable test. The longer I remain in college work the more convinced I become that college education is rather a testing than a training. If we make these tests severe enough we may in the end select sound pieces of timber—men not knowing a great deal but susceptible of rapidly acquiring a great deal.

In the South at least, as Doctor Jarvis' report will show, the colleges are really doing a part of the school work, particularly in general science lines. Our exit requirements are, I think, rather satisfactory even if our entrance requirements are not up to the standard.

J. H. Skinner of Indiana. We have been querying as to variations in entrance requirements, yet the requirements for graduation are quite as important. There ought to be more uniformity with reference to length of laboratory periods and requirements for graduation among our agricultural colleges. We find a great variation as to laboratory hours. Indeed, we find that there is a great deal of variation in this respect among the different schools in our own institution.

W. E. Stone. Your committee begs to report the following nominations:

Chairman, E. C. Perisho of South Dakota. Secretary, R. B. Hetzel of of New Hampshire. Program committee, the officers of the section.

Members of the Executive Committee: W. O. Thompson of Ohio, R. A. Pearson of Iowa, W. M. Riggs of South Carolina.

On motion, the report of the committee on nominations was received and adopted.

On motion, the section adjourned *sine die*.

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ENGINEERING DIVISION OF THE SECTION ON COLLEGE WORK AND ADMINISTRATION

AFTERNOON SESSION, WEDNESDAY, NOVEMBER 14, 1917

The division was called to order at 2 P. M., by the chairman, President W. H. S. Demarest of Rutgers College and the New Jersey State University.

ADDRESS OF THE CHAIRMAN

BY W. H. S. DEMAREST

It seems impossible for us to get away from the war atmosphere, by whatever call we are gathered together. We find that every interest with which we are concerned has something to do with the war situation, and of course it goes without saying that our colleges and all of our departments of instruction are more or less affected.

There are certain things in the present situation that have profoundly impressed me and have put a new emphasis on things which have been frequently in our minds in the past. One thing is the new and tremendous emphasis on research work. It has been interesting to think of what research, invention resulting from research, has had and is having to do with the conduct of this war. Governments have been seeking constantly of late for men experienced in research to enter upon research related to military affairs. We are perfectly aware that the demand reaches out into affairs other than military; that it has to do with industry that has been affected by war times; that our country has to do something that it has never had to do in the past; that it has to do some things better that it has not been doing as well as it ought; that we are looking out into the period beyond the war times when we shall have to accomplish many things which we have not accomplished in times past. All this implies a tremendous emphasis on research, on research efficiency in our institutions.

The Government has found it possible to depend on the Land-Grant Colleges in their agricultural organization in these recent times in a very remarkable way. It is quite a question whether they could have depended on the Land-Grant Colleges for engineering service in just the same way. That is the first thing that occurs to me in the emphasis of this war time; the tremendous call for a man who has the research quality and ability to give himself to research and for our institutions to surely organize their research departments. We have delayed too long in establishing engineering experiment stations. Here is a new emphasis telling us with great force that such research work as an engineering experiment station would promote is an integral and very imperative part of our undertaking.

A second great emphasis of the war time, of course, is scientific conservation. We are busy with the conservation of food, of raw products, of life, of power. The Government is giving itself to all that. Now, just carry that thought into the life of our institutions, the conservation of certain values of which we are stewards, not for our own welfare alone, but for the government welfare, as well. These are trying times through which we are passing. There is a temptation to let some things slip. We are stewards of great values, of our educational organizations, of our experimental organizations, if such exist. We must maintain our corps of instructors, we must maintain our efficiency. Not only so, but we are to

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maintain our student body as well as we can, not for our own selfish interests but for the sake of the country, in order to prepare the young men who, for their best value for our country in the future, should come from the colleges. This is a stewardship to which we must be faithful.

A third thing I have had greatly emphasized and impressed upon me is the cooperation between private power and government power. I think that this has been one of the characteristic things of these recent times. Private citizens are working with the Government for definite accomplishment. It is a work which really, in one sense, the Government ought to do alone. But it is calling for private contributions, for private service. That is a thing which we as colleges have not done sufficiently. Our state institutions, like the Government itself, ought to be able to call upon private cooperation and sources for our uses. I have wondered sometimes that we have done so much without such enlistment. These are days when the interests of the private citizen are bound up with the welfare of institutions. In every locality where one of our colleges is situated, in every State, there ought to be more of that private cooperation which has been so much in evidence in connection with private institutions but so little in evidence in connection with our state- and federal-supported institutions.

Another thing emphatic today is the necessity for thorough training of our young men. If there has been anything urgent in these days it has been that. The Government has called for men, especially for college men, because it regarded them as in a considerable measure well trained men. Complaint has been voiced that in military affairs the college men have had advantage over other men. The preference is unquestionably based on the fact that college men have had a training which makes them more efficient than those who have not had it.

The Government not only calls for well trained men but it puts them into positions to be further trained, so that they may be as well trained and efficient as possible. Now, it seems to me that here is tremendous emphasis on a thing which we have been repeating to ourselves often, and which we cannot repeat too often, namely, that the young men whom we have in charge need to be thoroughly trained. They are not to be simply filled with certain information, but their minds are to be so disciplined that they can solve their own problems. It implies a breadth of training which enables men not only to comprehend but to express things, in writing and public speech. One of my trustees stopped me on the street the other day and said, "We have heard the question argued as to whether or not college training was worth while. Was there ever a more spectacular evidence of the indisputable fact that the college man is the trained man that the world needs, than is to be found in the government's present demand for him along every line?"

Another thing to be noted is the claim of the sovereign, the right of our Government, over the individual, his power, his resources. If there is anything that has impressed me in these recent days it is this, that even a democratic form of government can stretch out its hand and say to a man, "That property of yours is mine to use; your life is mine to use." Here is a great enterprise and the Government steps in and says, "I have a right over all this." That is a thing of which in our institutions we ought to be ceaselessly aware. It is not alone that we as state-supported institutions are doing work that is in large part for the national welfare; it is more. There is nothing which we could better do for the student in our

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halls than to impress on him that thing, that not simply as an American citizen, not simply as a student, but as a student in an institution sustained by the State, he holds his talents and his efficiency at the command of the welfare of the State of which he is a member.

If I may speak personally, it has been one of the most gratifying things in the institution over which I preside that there has been a course for seniors in constitutional government and international law, in what we call political science, which teaches young men what it means to be American citizens and to be students preparing for the life of citizenship in the United States; and we have begun this year a two-hour course for sophomores throughout the year, on the rights and privileges, duties and responsibilities of American citizenship.

A last thing that has come to me with emphasis in this time is the new outlook, what we might call the necessary idealism, of the student and the citizen. It has come to us from the lips of our President, and from the stress of circumstances, that the whole world is the field of every man, and that a student must have that wide horizon and vision. The Secretary of Agriculture spoke of that this morning. He spoke of that idealism that every man should have and that the Government must have. It is my last thought, that I do believe there is nothing that we can do for our engineering students that is more vital than to get down into their souls a certain sort of idealism that will dominate their entire careers.

THE CHAIRMAN. The report of the secretary sets forth in brief the history of the campaign in which we are now engaged in connection with the engineering experiment station bill, as well as other important matters. Dean A. A. Potter of the Kansas State Agricultural College will present this report.

REPORT OF THE SECRETARY

BY A. A. POTTER

The engineering experiment station measure has occupied much of the attention of the officers of the division during the past year. At the last convention representatives were appointed to attend a conference held on Saturday, November 18, 1916, in New York City, with representatives of the National Research Council (Thirtieth Proceedings, page 141). I sent a statement of the results of this conference to all presidents and deans of colleges of engineering.

I attended a meeting of the Committee on Engineering Cooperation held in Chicago on March 29 and 30, 1917, and presented a paper on "The Land-Grant Colleges and their Cooperative Efforts," in which I tried to set forth the purposes of the Newlands experiment station bill. The results of this conference were sent to the presidents and engineering deans.

Representatives of 23 Land-Grant Colleges and Universities met in Washington on July 5, 1917, for the purpose of considering engineering experiment station legislation. The institutions represented at this conference were: Arizona, Arkansas, Delaware, Georgia, Indiana, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New Mexico, North Carolina, Ohio, Pennsylvania, Tennessee, Texas, Virginia and West Virginia. Suggestions were formulated for presentation to the Executive Committee in connection with the proposed modifications of the Newlands bill.

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At the suggestion of one of our members, several weeks ago I investigated, by means of circular letters, the effect of the war upon our engineering enrollments. Replies were received from 33 institutions with results as indicated below:

1. The enrollment in 1917-1918 as compared with 1916-1917 indicated an average decrease of 20.8 percent, the losses for different institutions varying from 4 to 42 percent.

2. As compared with 1915-1916, the enrollment in 1917-1918 indicated an average loss of 20.1 percent, the losses varying from 3.5 to 38.6 percent.

3. Gains in enrollment at the beginning of the academic year 1917-1918 as compared with 1916-1917 were reported from Alabama, Florida, New Hampshire, New Jersey and Texas. The southern institutions as a whole lost less than the northern ones. Seven institutions in the North Atlantic group reported for 1917-1918 an average decrease of 20 percent; five institutions in the South Atlantic States an average decrease of 12 percent; nine in the North Central group of states, 23.2 percent. The losses in the Central States were generally greater than in the East. Six institutions in the South Central States lost 18 percent, while four western institutions lost 25 percent.

Architecture suffered most severely, the majority of the institutions reporting that practically half of the students in architecture were gone. The average loss in electrical engineering is 28 percent, in mechanical engineering 25 percent, in civil engineering 23 percent, and in chemical engineering 12.5 percent. Four institutions reported gains in numbers of students in mechanical engineering, four in electrical engineering, eight in civil engineering, and nearly one-half of the institutions teaching chemical engineering reported gains.

Losses by the various classes were approximately as follows: Freshmen 1.5 percent, sophomores 14.2 percent, juniors 32 percent and seniors 31.5 percent. It seems, particularly in the larger institutions, that senior losses are less than those of juniors. In some of the middle states the sophomore decrease is serious and should receive immediate attention. The engineering schools seem to have suffered less than the other schools, yet their losses are large enough to demand attention.

The registration at Harvard shows a falling off of about 40 percent, at Yale about 35 percent, and at Columbia of 9 or 10 percent. The engineering losses at Columbia were considerably greater than our average, being in that case something like one-third.

The enrollment in many engineering schools will be materially increased by late registration and by second semester matriculations, yet the decrease is serious and should receive immediate attention.

THE CHAIRMAN. Prof. Alexander Gray of Cornell University will open the discussion as to "Changes in Engineering Curricula to Meet War Conditions."

CHANGES IN ENGINEERING CURRICULA TO MEET WAR CONDITIONS

BY ALEXANDER GRAY

There are undoubtedly in the audience many who are better equipped than I am to present this subject; men who are familiar with the work of the committees appointed by Dr. Hollis Godfrey; men who have been in consultation with the military and naval authorities, with the shipping

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board and with those responsible for the production of war material and men who have first hand information as to how the various educational problems have been solved by the Allies. I, however, can present the case of the average teacher of engineering, eager to serve but lacking information and guidance and, therefore, having to make changes in curricula on his own initiative and without advice.

There is little that we can learn from the experience of England. If the service is voluntary the student is in arms and the men of the technical school will be found in the rank and file of the Army. The wholesale enlistment of engineering students was condemned by the technical press but the boys saw where they could be immediately effective and so, only partially trained, they offered themselves for service; a few privates were added to the army, but the continuous stream of trained engineers necessary to keep the industries going, to supply the losses at the front and to meet the future needs of the country was cut off at its source. England has recognized her mistake because now, under conscription, an advanced student in the last year of his degree may be retained to complete his studies if the request is made on the grounds of public interest.

Of conditions in Canada I can speak with more authority because I was a teacher in the engineering department of McGill University during her first war session. This college, before the war, graduated about 100 engineering students each year and now has 858 engineering graduates and undergraduates at the front, of whom 108 have received decorations or have been mentioned in dispatches and 120 have been killed.

The session before the war had been quite normal, the officers' training corps attracted little attention and commissions in the corps went begging. There was, it is true, a military department which offered courses leading up to the examination for second lieutenant's certificate, but many members of the staff were bitterly opposed to the introduction of militarism into university life.

At the beginning of the first war session in 1914 the students flocked to the officers' training corps and the members of the staff from the dean down to the youngest instructor set an example to the students by joining the university battalion in order that the members of the officers' corps might have material on which to practice. Attics were cleaned out so that dummies might be set up for bayonet practice and a field wireless corps was organized by the departments of physics, electrical and mechanical engineering. This corps volunteered for active service almost as a man and my experience of the enthusiastic work of the boys as compared with the work of the regular class in wireless telegraphy has convinced me that military engineering work must be done in the proper environment and cannot be successful if conducted as part of the regular class work.

Canada has now been at war for three years and McGill University starts on her fourth war session with classes depleted but with her engineering curricula unchanged except that military drill to the extent of one and a half afternoons and one evening every week for the first term has been made compulsory for all students of the first three years and, because of the time thus taken away from study, the pass mark in all courses has been lowered five percent. Military engineering is offered as an elective subject during senior year to the extent of two lectures a week during both terms and one laboratory period a week during the first term. The subjects covered are military history, field engineering, map reading,

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sketching, etc., and the work is given by officers of the militia department. Military training of a similar kind was to be found at the Land-Grant Colleges even before the war.

There seems to be a feeling in some quarters, however, that we should go further, that military subjects should be introduced into the regular courses to satisfy what has been called the military enthusiasm of the student, that, for example, the electrical engineering students should be told about the electrical equipment of submarines, the electrical propulsion of ships, about searchlights and military power plants. Nothing would please the junior staff more than to receive instructions to go ahead on this basis, but I have not been able to persuade myself that such tinkering with fundamental courses is in the best interests of the student.

After all, the purpose of the college is not to fill the student with information but to train men who can think and act as leaders. Some of this training is obtained in the class room, much of it in the laboratory and no small part of it by work on the various student activities and advanced work with the university regiment where the men have a chance to develop judgment and character among their equals. Many of my last year's graduates have entered the service and have received recognition, but these men have not suggested that the courses be altered. Let me quote part of a letter than I received from one of these men who enlisted as a naval electrician and is now an ensign.

"I do not know whether you recall having mentioned at one of the meetings of our seminar how futile you considered the giving of special descriptive courses rather than broad gauge courses on fundamentals. I certainly agree with you now, as I find that even after such a short time out of school the specialties that we elected are hard to remember, but the fundamentals are there like glue. I have been giving a course of lectures to radio men, and had to treat subjects that were new to me, but, knowing the fundamentals, I have had no difficulty in telling amateur radio men things they never understood about apparatus they had been handling for years."

All of us feel that our present curricula are the best that we can plan for the training of young engineers. In the four years that are allowed there is not much time in which to offer courses which do not deal with fundamental principles. If a considerable amount of military engineering is to be inserted in the course, then something of importance will have to be sacrificed. For this reason, and also because I believe that a good electrical engineer is of more value than one who is neither an electrical nor a military engineer, I consider that it would be inadvisable to dabble with our courses. As the head of the civil engineering department at McGill University put it: "We have made no modifications in our curriculum to meet war conditions nor are any in contemplation. At the same time hundreds of our men have served with credit and something more in practically every branch of military service. Our men pick up their military duties very quickly."

To take up the other side of the question, are we at all sure that the Government prefers men who have had a little of military engineering smeared over their regular work? The manufacturing companies are not looking for specialists when they engage students; the electrical companies do not care whether a man has taken the electrical or the mechanical course at college; and the telephone companies, it has been whispered, fight

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shy of students who have specialized in telephone engineering. Years of experience have proven to the manufacturer that he is best equipped to teach the technique of the profession while the college is best equipped to lay the foundation. It seems to me that the Army is in the same position as the manufacturer. Twelve months of intensive training are necessary before a man is prepared to withstand the shock of modern battle. If the man is a technical graduate he will have a foundation upon which a sound structure of military engineering can be built. I do not think that the engineering graduate loses anything by going into the trenches, but that he will come out a better man than when he went in; but the country will lose his services as an engineer and for this there can be no excuse unless there is already a glut of technically trained men in the Army, the Navy and the essential war industries.

Up to this point I have done nothing but criticize adversely the suggestions that already have been offered. Do not think for one moment, however, that the universities are sitting back in smug content and saying "all is well with me." At Cornell University we are persuaded that certain elective courses, such as wireless telegraphy, topography, camp sanitation and the organization of the quartermaster's department, etc., can well replace other elective subjects, because we have men who know the principles of these subjects as well as the practice. We have also encouraged the enthusiastic student to join the engineer company of the Reserve Officers' Training Corps by allowing him to substitute not more than two credit hours for drill in the place of other senior electives. The electrical engineering department has taken over the technical training of the signal corps and is giving a course in theory of electrical circuits and machinery to those wireless amateurs who already know the code. The mechanical engineering department is doing similar work on the gasoline engine and motor car, and the department of civil engineering takes an active interest in the field engineering work of the Reserve Officers' Training Corps.

Over and above this the department of electrical engineering of Cornell University has made arrangements so that the senior class will get into industry in February, four months earlier than usual. While I was in Schenectady this summer I found that the General Electric Company was in great need of technical graduates to carry on the work of the test floor and we worked out a scheme whereby the students would have a slightly modified course for the first term and would then work for the second term on the test floor of the company. One professor and two instructors go with the men and the company provides classrooms so that theoretical work may be given from seven to eight every morning and for a four-hour period every Saturday morning. The work of the second term is principally a study of machinery. It was felt that the student would gain rather than lose by making a study of this machinery at the place where it is being built. I understand, of course, that all colleges and departments cannot make such a happy arrangement, but I offer it as a suggestion of one way in which the work of the senior year can be intensified and the men trained ahead of the usual time.

To summarize I would suggest:

(a) That courses on fundamental principles be not changed.

(b) That two-hour elective courses for seniors be offered on the principles underlying certain special lines of military engineering.

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(c) That the staff offer its services to the Reserve Officers' Training Corps for purposes of technical instruction.

(d) That work in the Reserve Officers' Training Corps be accepted as the equivalent of two elective hours.

(e) That courses on engineering principles be offered to the wireless amateurs and automobile drivers of the University.

(f) That an attempt be made to get the seniors into industry earlier than usual so long as their technical work does not suffer.

THE CHAIRMAN. The discussion will be continued by H. W. Tyler of Massachusetts.

H. W. TYLER of Massachusetts. I am glad to express my cordial agreements with what Professor Gray has said in its essentials. I take it we are discussing, aside from main principles, the special procedures adopted in various institutions. It seems to me under present conditions we ought to recognize these three important principles: First, to make provision that an instructional staff, more or less seriously depleted, shall be able to carry on the work as completely as possible; second, to see that the younger students are persuaded not to break off their education prematurely, being made to realize as far as possible that it is also a patriotic service to prepare for maximum future efficiency; and third, to organize, or if necessary reorganize, our work so that the best practicable provision shall be made for students who enlist or who are drafted into the national service and who wish to accomplish as much as possible during the time they are able to remain in college. The working out of these principles takes a variety of forms under varying conditions. We have found it expedient, and I presume others have found it so, to deal with questions as they arise through a central committee authorized, for example, to remit certain requirements for graduation, as well as to provide a considerable range of military instruction by military men during the college year and during summer vacation.

During the summer vacation we have duplicated so much of the work of the year that the junior students have been able to complete the required work of the senior year a half year earlier than would have been otherwise possible. This has enabled us to offer a half year's instruction, for example in naval architectural drafting. Students in naval architecture immediately disappeared when war was declared, but their places have been filled by other men from other departments. Fifty such men completed an intensive course in naval architectural drafting last summer, and as many more are about to commence it at the middle of the current year. But for such a program, the junior class would have been very seriously depleted in numbers. In mechanical engineering, for example, where we should normally have about 75 men coming up for graduation at the end of the year, about 25 of the 75 have already entered the service, about 30 more have accelerated their programs and are finishing at the middle of the year, while the remainder are following the old schedule. As yet the freshman and sophomore years have not been seriously affected.

For the future we may need to consider, besides the summer work, the elimination of highly specialized courses and, perhaps, an extension of the daily program. In all this, as has been so admirably expressed by our chairman, on no account must we sacrifice character education to mere technical efficiency.

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THE CHAIRMAN. The discussion will be continued by Dean E. F. Coddington of the Ohio State University.

E. F. CODDINGTON. At the opening of the present academic year, under the provisions of General Order No. 49 of the War Department, a Reserve Officers' Training Corps was organized by our military department composed of students from the Colleges of Arts, Education and Engineering. Each of these institutions have made provisions in their curricula whereby a limited amount of credit in such work is offered towards graduation.

The College of Engineering permits those of its students who are admitted into the Reserve Officers' Training Corps to substitute 12 hours, or three hours per semester, for regular work of the last two years. This military work is substituted for fixed work, except in a few cases where there are electives.

No further attempt has been made to modify our engineering curricula to meet war conditions. During the spring of 1917 President Thompson appointed a committee from our engineering faculty to meet and confer with a similar committee from Case School of Applied Science, Major Bond of the United States Army being present. As a result of this conference and in accordance with the recommendations of our commandant, Major George L. Converse, we concluded that no modifications of our curricula would be likely more efficiently to prepare our students to serve their country in times of war. The arguments that led to our conclusion are essentially those advanced by Professor Gray. Furthermore, may I suggest that our commandant states that self-reliance is the most valuable asset in the equipment of an army engineer. It is, therefore, our duty to do all in our power to develop this desirable qualification in our students.

Much of an army engineer's work is of an emergency nature. It is likely to be different from any engineering work he, or perhaps anyone else, has ever accomplished. In order to be successful he must be thoroughly trained in the fundamental sciences and have full confidence in his ability to do the work needed to be done. It is impossible to prepare him by giving him the same task in the University that will arise in the field. This is what would be attempted if military engineering subjects were introduced into our curricula. This is not done to any great extent even at West Point. The graduates of that institution who give promise of engineering ability are sent to a special army engineering school to complete their engineering education.

During these critical times, while we are endeavoring to prepare an army which will be capable of meeting what has shown itself to be the most powerful fighting army on earth, we send our engineering corps, as well as other branches of the service, as near to the front as possible in order to give them their final training.

I say, therefore, that it is impossible for us to teach our men the latest art in warfare, but it should be possible for us to train our engineering students in the fundamental sciences and to develop a certain amount of self-reliance in order that they may have some hope of success when they are given difficult problems to solve on the firing line. I believe that this can be most efficiently done by adhering to our already organized and tried curricula in which the fundamental sciences should predominate.

This leads me to the thought that perhaps now is a propitious time for us to take stock of what we are accomplishing, because it may be pos-

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sible that our curricula may need modification in order to meet peace conditions when war is over. We must not lose sight of the fact that probably most of our students will find their most difficult and important life tasks after the war is ended.

P. P. CLAXTON of Washington, D. C. The general consensus of opinion among those in Washington most directly interested in this problem of the training of engineers for service abroad seems to be that it is best to give them a comprehensive understanding of fundamental principles. Apparently no one knows just what the tasks of individual engineers or groups of engineers may be on the other side. It is easier to say what will be required of buzzer operators, radio operators, gas welders, and others of a similar or lower grade of work and to determine what specific instruction will be most helpful to them. I agree with those who hold that few changes need be made in the general courses in engineering to meet the demands for engineers for the army. No changes should be made rashly. To be sure, the war has served to broaden the scope of engineering problems and we are, it is to be hoped, constantly learning more of the pedagogy of this and of other subjects. These facts call for careful revisions of courses and methods on a larger scale perhaps than in normal times, but they are mostly of the same nature.

But I am now interested more in another phase of the problem, the quantitative rather than the qualitative phase. Never before in our history has there been such a demand for engineers of the best and highest training and the demand will be larger and more insistent still after the war is over. The world must then be rebuilt, and rebuilt consciously on the best scientific principles and with the help of expert skill. The destruction of war in Europe must be made good by the constructive work of the engineer. New Russia and new China with their millions of square miles of territory, their hundreds of millions of people, and their untold resources will enter upon a period of development such as they have never known. All South and Central American countries are approaching the industrial stage of their development. In our own country there will be much to do in repairs, readjustments and new enterprises on a larger scale than those of the past. It is easy to see that the demand for engineers will be unprecedented.

The number of engineers, however, now in training is unusually small. The attendance of students at the English, French, Italian and Canadian universities is only 15 to 20 percent of the normal attendance. In German universities this year the attendance is from 15 to 40 percent of the normal. In all these the proportion of women is larger than before the war and many of the students are disabled soldiers. The world must, therefore, look to American colleges, universities and technical schools for its supply of engineers in the immediate future.

It should be remembered also that the wastage of engineers among the Entente Allies has been very large, thus tending to exhaust the supply, especially of those of middle life and younger. England had to make up her mind over night whether or not she would enter the war. Having decided to fight, she had to put an effective army on the firing line in the shortest time possible. Not having a large army ready she had to depend on volunteers and, as is always the case, an undue proportion of the volunteers was made up of men from the universities, colleges and technical schools. This was but natural and in a very fine sense right, but it was costly. In

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those earlier days of fierce fighting and want of preparation the wastage was very large. Many of the best trained men died in the trenches and in No Man's Land. More were returned injured for life, unable to continue actively in their professions. The world now knows something at least of the results for England, and what is true of England in this respect is true also in greater or less extent for France and other allied countries.

May I, therefore, urge upon you, as engineers and college men, the high patriotic duty of bringing into the engineering schools and courses the largest possible number of young men and of holding them there against all temptations until they have received such training as you can give them. Should the war be long you may in this way contribute more effectively to our final success than in any other way possible; for the engineer becomes more and more important as the war goes on. Without the aid of these trained men the patriotism and sacrifice of hundreds of thousands of our common soldiers may be in vain. It should be remembered that the attendance of men in the engineering classes of all of our schools might be doubled without affecting materially the supply of men available for enlistment.

In making this plea, I am sure I voice the undivided sentiment of the administration at Washington.

THE CHAIRMAN. Dean H. S. Boardman of the University of Maine will continue the discussion of this general subject.

MODIFICATIONS IN ENGINEERING CURRICULA TO MEET WAR CONDITIONS

BY H. S. BOARDMAN

This crisis is evidently an unknown quantity at present in engineering education. We appear to be marking time and waiting to see whether changes will be demanded as a consequence of the war.

A canvass of 56 engineering institutions shows that very few have made important changes in their courses of study. All specify their willingness to cooperate with the Government in giving special work. Many have placed their entire plant at the disposal of the War Department, and in several instances their equipment is being used by them. Many institutions are giving short courses directly relating to the present conditions. Among these subjects appear so-called military engineering, aeronautics, signaling, telegraphy, telephony, wireless, map making, navigation, marine engineering, explosives, etc. All these courses attempt to fill either a fancied or a real demand. In many cases good work is being done and a real service rendered. In other cases, however, it appears that the work given results only in a "letting off of steam," without much being accomplished.

The preliminary report of the committee appointed by the Advisory Commission of the Council of National Defence to study the relation of engineering schools to the National Government during the war reports that "while undoubtedly the necessities of the war will make desirable material changes in the curricula of engineering schools, it is at present impossible to foresee what these changes will be. The committee is not yet prepared to recommend any fundamental changes in courses of study." Unless the War Department requests us to change our general scheme of education and teach military engineering, it appears to be the best policy

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to keep on in the future as we have in the past. After the war there should be no call for any but military institutions to teach military engineering and we hope that such a lasting peace will be obtained that even they will, in time, disappear. Civil engineering, used in its broad sense, will never disappear, and it would seem that present conditions offer an excellent opportunity for a general house cleaning to institute a searching investigation in order to determine the best balanced curricula in the different branches of engineering in educational institutions.

I fully agree with Professor Gray that the chief purpose of the college is to train thinking men. It matters little whether they take this course or that, if they have developed the power to think for themselves. A clear mind is the foundation upon which their future success rests. All the facts in the universe amount to very little if one has not the power to use them logically.

The development of American education is very clearly reviewed in an address given before the Land-Grant College Engineering Association by Dean Marston in 1914. This review calls attention to the fact that "in early American education the typical institution of higher learning was the old denominational classical college, and the school of theology was about the only professional school * * * schools of medicine and law were developed later * * *. From these classical schools and professional schools grew in time our great privately endowed American universities. In the middle half of the nineteenth century our newer States broke away from the early American tradition by establishing State Universities * * * yet they retained many of the customs and prejudices of their privately endowed predecessors. They willingly trained lawyers, doctors and teachers; and engineers, after engineering had won a hard earned recognition as a profession." In 1862 the Morrill Act established the Land-Grant Colleges, and since that time engineering education has been struggling to find itself. During the past 20 years its development has been rapid and its standards have become more and more sure.

Two extremes have appeared. One is the "survival of the fittest" in which only those who can pass a rigid course of training are allowed to continue in an engineering curriculum and the other is the method whereby the large majority of men who elect to study an engineering course are allowed to stay even if they make only a fair record. The first class is supposed to furnished "picked men" and the second to give the poorer student a chance after graduation to show his value in the so-called practical field, with the idea that he may develop in time into as efficient an engineer as a man in the first class.

I believe that in too many institutions so-called practical engineering subjects have crowded out those which tend to create a broad and liberal education. Too many engineering teachers cannot see beyond their narrow special field. There is so much to an engineering curriculum now-a-days that the tendency has been to force in the engineering subjects and then, if there is any time left, to allow its use for outside subjects. It is difficult to impress upon the engineering student that his knowledge of English, for example, is just as important as his knowledge of mathematics, if the head of his major department does not believe this to be true.

Many complaints have been made that engineering has not received the respect and recognition accorded to law and medicine. Let us ask ourselves whether we are giving courses in connection with engineering that

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can compare in breadth of view and general education with law and medicine. Just so long as we neglect such broadening influence and pay attention mainly to turning out a highly specialized "machine," then just so long must we rank below the so-called "learned professions" in public esteem. Much progress has been made in the past, but more must be made in the future if we are to take the place which properly is ours.

Let us study our curricula with a view of giving to our young men such training as will fit them not only to become specialists in civil, electrical, chemical and mechanical engineering, but will also create in them a desire for a broader development, which will tend to make them not only happier and more useful citizens but fit them to cope more successfully with their fellow men.

THE CHAIRMAN. The discussion will be continued by Dean C. E. Ferris of the University of Tennessee.

C. E. FERRIS. I have the misfortune to agree with Professor Gray and all those who have followed him. It would be far more interesting if I could start a new thought. I may say, however, in self-defence that my opinion had been formed before I read the outline of Professor Gray's paper.

I approached the subject in a somewhat different manner than did Dean Boardman. I made a canvass of my own institution, picking out men who were engaged in different lines of work. For instance, I discussed the subject with a major, a retired officer of the regular army, who received his training at West Point; also with a major of the regular army who received his training in the University of Tennessee, who served 12 years in the Army, and is now a teacher of military science. I laid the matter before another type of man, a professor of mathematics, whose training was wholly along classical lines. Then I sought the advice of a teacher of engineering, who received his early training in a classical college. These four men were approached in the same way. I said to them: "Assuming, because of the war, that a change in our engineering course is advisable, what change should be made?" In no case could I get any response from these men looking to any changes.

The last speaker brought out a good thought, that after this war is over and readjustment is necessary, then perhaps, but not until then, will it be wise to change our courses of study to any great extent. I get this response at once, from every man with whom I discuss this matter, that we need to do our work better, that we need to emphasize the fundamentals of our work, mathematics, descriptive geometry, physics, chemistry, mechanics, hydraulics, thermodynamics, electricity. If we improve our work along fundamental lines we may then hope, with some degree of assurance, to produce men well equipped to meet war conditions.

When General Black was asked if he would advise the teaching of military engineering in our colleges, he said, in substance, that military engineering consists in doing what you are told to do, whether or not you have the men or the equipment wherewith to do it; that it requires resourcefulness to meet emergencies, something we cannot teach. A man who is well taught in the fundamentals, other things being equal, will be the man to meet an emergency when it comes.

Since we have joined the Reserve Officers' Training Corps, I have felt that we should be willing to give some of our time in the senior year to the

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military department, in addition to that which they now use, to be treated as the commandant may see fit. If we are to teach military engineering, it should not be done by a professor of civil or electrical engineering, but by the head of the military department.

THE CHAIRMAN. The formal discussion will be closed by Dean C. R. Jones of West Virginia University.

MODIFICATIONS IN ENGINEERING CURRICULA TO MEET WAR CONDITIONS

BY C. R. JONES

Professor Gray was kind enough to send me a summary of his discussion in advance. In an accompanying letter he expressed the hope that his remarks would call forth much criticism. All of us are anxious to do more than we are now doing and would like to discover some short, easy way of training our students to meet the present emergency and at the same time not sacrifice their preparation for life work. As has been stated by Professor Gray, nothing would be more pleasing than "to throw our regular courses to the winds" if some one could suggest more effective methods; but thus far no one has pointed out a way by which the military applications of engineering may be taught without preliminary training in the fundamentals, except by greatly lowering our standards of scholarship and training. I am in full accord with Professor Gray in believing that the purpose of the college even in this crisis is to turn out thinking men and that the fundamentals should not be abandoned. Even for the sake of argument I am unable to take exception to the general position that he has taken.

The amount of time that can be devoted to strictly professional applications in a four-year course, after covering the fundamentals, is relatively small. Outside of minor alterations that may be made in the curricula to meet local conditions, the only changes that seem feasible are the omission or abbreviation of, perhaps, a few non-essential professional courses and changes in the point of emphasis in others.

Strictly military applications of engineering principles should be taught under the auspices of the military divisions, even though the work is given by members of the engineering staff. This arrangement affords an opportunity for engineering instructors to be of service and brings them into closer touch with the military work. When given by the military division such courses are more likely to be taken by all members of the Reserve Officers' Training Corps who have the necessary preliminary training than were they announced as engineering courses. This plan, however, does not settle the question as to whether credit toward engineering degrees should be allowed for military courses.

In common with other Land-Grant Colleges we require two years of military service and allow a nominal credit of one hour per semester or a total of four hours for the two years. We have not, thus far, allowed credit for the last two years, although practically all of the engineering students continue in the military department until they graduate.

As the general subject has already been pretty thoroughly discussed, I shall confine my further remarks to the manner in which we have met local conditions at the West Virginia University.

Following the declaration that a state of war existed between the United States and Germany there was a rush on the part of all engineer-

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ing students to offer their services to the Government. The air was tense with excitement. Then came the meeting of the college presidents at Washington and the message of the Secretary of War, the Commissioner of Education and others, advising engineering students to remain in college until they finished their courses. The inference was so strong as to amount to a promise that engineering students would be exempt from the draft unless they were needed for special work calling for technical training.

A mass meeting of the faculty and students of the College of Engineering was called, which was addressed by the president, by members of the faculty and representatives of the different classes. It was suggested that in view of the phenomenal demand for technically trained men for military duty and for manning the industries, it might be advisable to make the session of the college of engineering continuous and slightly to abbreviate the curriculum. It was not the intention to lower the standards of scholarship but to intensify the work, leaving out only subjects or parts of subjects not strictly essential in the present crisis. The suggestion met with enthusiastic approval by both students and faculty. The meeting did much to steady the students and the effect in better work was immediately noticeable.

Following the meeting, I appointed a committee composed of the heads of the departments to work out a plan. At first some members of the faculty went so far as to suggest that by running continuously on the four-quarter plan students could be graduated in two years, or, at most, two and one-half years. The committee at its first meeting on May 11 decided that the first two years of the course could not be shortened and recommended that the present junior and sophomore classes in the college be graduated in December, 1917 and June, 1918, respectively, provided every member of each class who had not already enlisted for military duty should return to his studies immediately after commencement, 1917. Working schedules for the necessary modifications were to be prepared to be considered at a subsequent meeting. Here the real difficulties began. A satisfactory schedule could be easily arranged for the seniors but not for the juniors, and on May 14 the committee recommended:

"That the effort to hasten graduation be limited to the work of the senior year, curricula having been prepared and submitted which will permit the work to be completed December 15, 1917, embracing 28 out of the 36 semester hours in the regular senior courses."

Acting on the latter recommendation, the faculty ordered:

"That the present junior class be recommended for degrees in June, 1918, provided they shall have completed the work outlined by the committee in a satisfactory manner and, further, that all such students shall be expected to engage in professional or military work for the remainder of the college year." This order was later confirmed by the Board of Regents and the plan has been carried out.

The modifications in curricula were made to apply only to the senior year, because it was found that the first three years of the curricula consisted so largely of fundamentals that could not be abbreviated and that the time that could be saved by shortening or omitting less essential subjects would not warrant any changes. On the other hand the work of the fourth year could be somewhat abbreviated without materially lowering the standards for graduation.

The continuous session was not made applicable to the lower classes.

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because of added mental and physical strain on the part of both students and faculty, lack of opportunity for practical experience during vacation periods and the serious financial problems which would have to be met both by the students and the college.

On the other hand, it was felt that the seniors could remain in school until December 15 without serious danger to health. All of them already had had vacation experience, the additional expense would be small and that of the students would be less than for the regular year. With one exception all were of draft age. The plan meant six months' saving in time to the students and greater probability of getting their degrees before being called for military service. Most of the juniors withdrew their applications for admission to training camps and all who remained until commencement not only endorsed the plan but remained to take the course.

The modified curricula omitted: Thesis, 3 hours; an English course, 1 hour; contracts and specifications, 2 hours; and the work of the engineering society, 1 hour credit. Several students are taking the English as an extra subject. By concentration and intensifying the work the schedules were so arranged that each member of the staff who took part in the summer work was able to have a month's vacation at some time during the year.

All agree that this concentration and intense application of the work, whereby the student carried fewer subjects at one time and recited four or five times a week, was one of the main contributing causes of the success of the plan. The amount of work actually done will almost equal that of the regular curricula. No real sacrifice has been made in the amount of work done while the quality has been above the average. The practical experience that the students will doubtless gain between the time when their courses are completed and commencement day, will more than offset the loss of the summer vacation.

No new courses have been introduced but the emphasis have naturally been somewhat altered. Military applications in such courses as bridge construction, concrete and masonry construction, highway engineering, signaling and gas engines are constantly being sought on the part of the students and naturally more attention than formerly has been paid to such applications. As an example, mechanical seniors have one optional subject to be selected from a group. Formerly electives were divided about equally between advanced courses in steam turbines, industrial management, materials of engineering and gas engineering. This year all of them elected gas engineering and requested that the time be largely devoted to internal combustion engines applicable to automobiles, tractors and aeroplanes. As a result this particular course had to be entirely recast.

Only one episode threatened the success of the work. Two of the students were called for examination by the draft boards. In view of the representations that had been made to them they naturally thought that at least they could obtain furloughs until they finished their course in December; but no consideration was shown them by local or district boards or by the Washington authorities. One of these men is now at Camp Lee and the other, who had been previously turned down for the Second Training Camp because of flat feet, was passed by the draft board but, later, exempted on the report of the officer making the first examination. Somewhat later two more students were called, one of whom failed to pass because of a slight displacement in one of the nose bones, which the

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examining officer said could be corrected by a slight operation. The student elected to leave the bone alone and postpone the operation until he finished his work. The other has been certified for service and is in college awaiting call. Fortunately the numbers of most of the class will not be reached until the third call. All of draft age are likely to be called before the end of the regular school year.

Both faculty and students are pleased with the results and if the conditions warrant the plan will be followed again next year. The students say that they have received as much benefit from their work as they would for a full year and that the plan will enable them to secure their degrees before their call comes. All who could have passed the physical examination would have joined some branch of the service earlier had this opportunity not been open to them.

Some reasons why the plan has proved successful are:

1. That all who expected to remain in school wanted the continuous session and all came back. One man had to be refused because of deficiencies.

2. That those who elected to remain, with one exception, were unusually strong men.

3. That the classes were small so that the individual members received more personal attention than they could ordinarily have been given.

4. That the summer was cool and almost ideal for study and work.

5. That the incentive for high class work was a preparation for the the immediate future.

The net additional cost of the continuous session will be slight. The members of the staff who worked during the summer were paid a nominal sum for extra services, but this extra cost to the institution has been almost cancelled by the saving in salaries of staff members who have been called for military service whose places would have had to be filled if we were operating on the regular schedule.

I asked members of the faculty for their opinions. Several have given me their views in writing.

"The value of continuous school work throughout the summer should be judged from two points of view: first, the results of the work itself, and, secondly, the influence of the summer work on the work of the regular year.

"The grade of work done by the students during the summer was very satisfactory; in fact, I believe that it was better than the average during the regular school year. This improvement was due chiefly to the intensity of the work. This was made possible by taking fewer subjects at one time and spending more hours per week on them. I believe that it is almost impossible to teach properly any mathematical subject in which there are not more than two recitations per week.

"Another possible reason for improved grade of work was the absence of other activities tending to divert the student's interest from his regular work, such as fraternity and club interests, athletics, etc.

"I believe that the summer work has had something of a weakening influence on the work of the fall semester. To carry school work throughout the whole year makes a long, tedious grind for the average student. It cannot help but lower his interest in the work. In the particular case at hand the effect will not be very pronounced since the students will complete their work before Christmas. I would not advise carrying summer work for those students who are to take nine months of regular school work."

R. P. Davis,
Professor of Structural and Hydraulic Engineering.

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"While the amount of required work has been reduced, I believe that the training and preparation which the men receive will be as valuable, if not more so, than it would have been had they been required to stay throughout the year and follow the regular schedule. This statement is based on the grade and quality of work done by the present seniors as compared with that done by the seniors last spring. I find, with the exception of one member, that the present class is doing conscientious work and endeavoring to get everything possible out of it. The students are accomplishing more than the preceding class, although the two classes are about on a par as to the abilities of their members.

"I will not attempt to explain why this is true, but simply will say that the men of last spring's class seemed so eager to get out into military work that they lost real interest in their classwork. I think the same would be true of the present class if it had to stay until next June.

"The character of the work of instruction in my classes has not been varied any appreciable amount, except as to omissions and these have been made when it seemed that the work was of not special value under the present unusual conditions.

"Further, I think that as an emergency measure the change has been quite successful in accomplishing the desired ends, and that as long as the present conditions continue I feel that the present plan should be followed. However, as soon as conditions become normal again I think we should return to the regular schedule, as then the incentive and attitude of the student will not be the same as it is under the present stress of conditions."

A. H. Forman,
Professor of Electrical Engineering.

"Judging from the attitude of the students the intensified work of the senior year has been a complete success.

"In one or two cases there was no doubt some disappointment experienced. Several juniors in colleges other than engineering were admitted to the training camps and commissioned as second lieutenants. Engineering juniors were advised to remain with the understanding that they would be exempted from draft prior to graduation. This understanding was not recognized by the draft boards and one of our men has been called, is now drafted as a private and has had no opportunity to work for a commission.

"It seems to me that before this scheme can be made a complete success it must have the endorsement of the War Department, which should agree to exempt all students in their senior year while attending an engineering college.

"It does not seem to me that the courses were shortened enough materially to affect the qualifications of the students for positions that they would naturally take after the usual four years' training."

J. B. Grumbein,
Professor of Steam and Experimental Engineering.

"The continuous session was certainly more than worth while. The men will enter military service or the industries much better prepared to do work than if they had entered upon such work at the end of their junior year. They will now go out as graduates, feeling that they are technical men and on common ground with other technical men. They now have no excuse for not making good. Even if they have not all been called into the service before June, they will be able to enter permanent work six months earlier. This alone, when the number of graduates are considered, will many times compensate for the time the instructors have spent during the extra session.

"The intensive schedule as carried out fully compensated for the shortening of the course, as the students involved were of sufficient maturity to stand the concentration. The student's time was not divided up with other activities.

"I am entirely satisfied with the undertaking."

A. A. Hall,
Associate Professor of Electrical Engineering.

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"The experiment of intensive work for senior engineering students during the summer of 1917 has been a success in achieving the end aimed at—that of completing their engineering training and getting them out into the industries or into military service at the earliest possible moment. The possibility of success depended on (1) willingness of all senior students to adopt the scheme; (2) equality of standing, with little or no back work to make up; (3) a reasonable equality of maturity, as measured by general education in non-technical matters; and (4) a reasonable equality of ability to absorb, without the usual summer vacation, the work of the continuous session. All of these were present to a greater or less extent last summer and, therefore, the work was successful.

"The subjects omitted from the shortened curriculum, being mostly non-technical and semi-cultural, are not necessities from a purely engineering standpoint, but with the ever-increasing demand for broader training, especially in English and the 'humanities,' the omissions are to be considered as a detriment to the students. The scheme should not be repeated unless the majority of the conditions mentioned in the first paragraph are present."

E. F. Church, Jr.,
Professor of Machine Design and Construction.

C. L. Cory of California. Personally I am not much concerned with the question as to whether the courses which we have been giving our engineering students are or are not the best under the present circumstances. I am concerned, however, with a more important question, namely, will we or will we not have any engineering students in the next few years to take these courses?

Commencement in 1917 occurred at the University of California about the middle of May. Ordinarily we graduate from 50 to 60 men in electrical engineering. The first Reserve Officers' Military Training Camp began a few days before commencement, being located at the Presidio Military Reservation in San Francisco. As a result, more junior students in electrical engineering went to the camp and ultimately received their commissions and were assigned to duty than returned to the University at the end of the summer vacation. As a matter of fact, it is not the draft that is taking our engineering students as much as their volunteering through the training camps, the larger part of them becoming commissioned officers.

I heartily agree with the fundamental propositions laid down by Professor Gray, enlarged upon by Dean Boardman, and so concisely expressed by Commissioner Claxton, to the effect that the kind of training we should give our engineers, whether for service during or after the war, should not consist merely of informational courses but, on the contrary, of fundamental courses which train them, which tend to teach them to think and to differentiate, and which develop them for the highest and best service. Secretary Houston said as much this morning when he pointed out the fact that the spirit of the American people will have as much as anything else to do with success in the great war in which we have joined.

The last speaker has stated that his students were enthusiastic as to the changes which had been made in their courses. May it not be true that the spirit of both instructors and students is improved because of their intense interest in these readjusted courses? Surely now is the time to revivify the spirit that we must have in our engineering instruction.

I heartily endorse the action taken by this division touching the proposed detail for instruction in the colleges of engineering of those students who will be called to the military service prior to their graduation. I think that we should understand that what is desired is that these men

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are to be detailed to this type of service for such a period as their scholarship is satisfactory and that, if possible, their details are not to end before graduation.

L. S. Randolph. Last spring I asked Gen. Black what we could do to improve our course of instruction. He replied, "I do not think that it would be advisable to make any changes in your courses. In fact, the examination we have given has shown that what the men know is very satisfactory, except perhaps the knowledge of constitutional law and a little greater familiarity with history. We find, however, that a diploma does not always represent thorough work, and we would urge a much more thorough handling of the curriculum."

We have made no changes. We went over the matter with our graduates and they say that the training was about right. Most of our men went into the Coast Artillery. We graduated those who entered the first camp about three weeks ahead of time.

H. W. Tyler. Much emphasis properly has been put on keeping the curriculum substantially unchanged, and it is worth while to emphasise as a correlative idea that wherever we can expedite the program without substantial sacrifice of the character or quality of the work, it is our patriotic duty to do so; not merely that it brings our men sooner into the national service, and that it perhaps anticipates the draft, but, also, that it puts the students themselves in a better psychological attitude towards the work and enables us to retain a larger number of them.

The Secretary. In view of the fact that about 30 institutions are represented here, would it not be well to find out their policies with reference to such students as are selected for military service? What credit is granted to seniors thus selected? Do they receive their degrees if drafted, for example, at the beginning of the second semester?

E. F. Coddington. The Ohio State University has passed resolutions going just one step further than this. It has voted that credit for a whole semester's work shall be given to all students, seniors, juniors, sophomores or freshmen, in any semester, who have completed satisfactorily at least half of the semester's work when called into military service. Seniors thus called after the middle of their last semester will receive their degrees.

L. D. Crain of Colorado. After war was declared, the Colorado faculty voted that students be given their grades whenever called into the service, and that seniors thus called would receive their degrees if at the time they were up in their studies.

Our engineering department is cooperating with the military department in the matter of drawing, doing some of the sketching or drafting that is required in the military department as a part of the engineering drawing.

Brown Ayres. In regard to the original question, may I call attention to one letter that I received, and doubtless other members of this body may have received the same, some months ago, from the Adjutant-General of the Army. This circular letter called attention to the results secured in the examinations for the first officers' training camp, and rather painfully arraigned our whole educational system. He said that the

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general fault the military men had found with college young men—he spoke of college men particularly, not perhaps to make any exception of them as against other men—was what he might characterize by the general term "slouchiness of attitude. He said that a boy seemed to think that when he was on dress parade he should hold himself up and be a man, but that as soon as he broke ranks, he could slouch; that in the periods between military formations he slouched, laid around and smoked cigarettes, whereas the real military man ought to be conscious of being such at all times. He said, furthermore, that this was not physical only, but that the young man's attitude toward life and its problems was slouchy; that he seemed to be saying, "Oh, well, it is not worth the effort; it is not worth while."

Now, those who have had to do with students know that that is a feeling that we have to try to overcome. We ought to try now more than ever to impress upon our students the fact that they are not studying to get through, or to get a degree, or to get ready for a job, but are actually in training to make themselves worthy of being soldiers, of being in the service of their country in a great emergency. We should impress upon the student that he should brace up and stiffen up and attack every problem that is put before him with the best ability and energy that is in him. If we can inculcate that spirit into our students, it is comparatively unimportant what particular subject or subjects may be added to or dropped from the curriculum. It is the attitude and the spirit, the fervent desire to do one's duty at this time, that is the most important thing that we need to teach our students. I believe the Adjutant-General's letter is really worthy of very serious attention. I have placed it where I can pick it up from time to time and read it over in order to see if I can find in it a new suggestion as to how to help our men to become better than otherwise they might be.

One thing we have done at Tennessee as a direct result of that letter and, also, of the address made by Secretary Baker before the National Athletic Association last August. Secretary Baker said that an army could not be built on the basis of athletic teams, but that all students should be encouraged and made to make themselves physically fit. In view of that statement and of the fact that the draft boards have thrown out many men because of minor defects which they said were easily remediable with a little time, if the knowledge had previously been in their possession, we have introduced a requirement at Tennessee that every man in college must be examined by a physician in exactly the same way as he would be examined if he came up for the draft or to enter the army, and in case of physical deficiency he is warned as to its existence and set physically to work to remedy it, provided it is remediable. Then we have required every man to do a certain amount of physical exercise of some sort in lieu of supporting the regular university athletic teams.

Now it seems to me that what we have to do is not to change our engineering curricula, but to try to make our young men understand that this serious business of war calls for their most earnest devotion and consecration. One of the finest speeches I have heard, truly eloquent because it was suited to the occasion, was delivered by one of our men who returned on furlough from one of the camps, to the students, appealing to them to make themselves fit by doing their duty in college in the same way as the men who had gone before them, and whom they were soon to follow,

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had made themselves fit to do their duty in camp. Now, if the students feel that while they are in college they are doing their best to make themselves fit by doing thoroughly the jobs, this mental attitude is worth more than mere curricula modification.

THE CHAIRMAN. Dr. S. P. Capen, specialist in higher education of the Federal Bureau of Education, a member of the committee which represents the Society for the Promotion of Engineering Education to cooperate with the War Department, will discuss the new classification for the selective draft in its relation to our student bodies.

S. P. CAPEN of Washington, D. C. You are probably aware that there is a Committee on Education organized under the Council of National Defense. The committee has realized for a long time that there would be a shortage of trained men and that it was highly important that to students in engineering and agricultural courses and students of veterinary medicine should be accorded privileges similar to those which have been granted by act of Congress to students in dentistry and in medicine. This committee presented a series of resolutions to the Council of National Defense asking it to lay the matter before the President and to urge an executive order, treating students of agriculture, engineering and veterinary medicine in the same manner as students of medicine and dentistry are being treated. Those resolutions were presented to the advisory commission of the Council before the new classification of the selectives was announced, and they were acted upon and passed along to the Council. The committee has not yet been informed of the final action.

The new classification was then issued, and I was urged by the committee to call the attention of the Secretary of War to the fact that college students of all sorts apparently will fall into class 1, unless the orders are so interpreted as to place them in some other class. The Secretary stated that he realized this difficulty and danger; that the interpretation of the classification was not as yet thoroughly settled; and that he would be very glad to hear from representatives of colleges and universities before final decisions were made. I presented to him at that time a memorandum which indicated the number of persons affected and, in brief, the reasons why it seemed wise to allow these men to finish their courses. This was turned over to the Provost-Marshal-General, and a few days ago he wrote me a letter, a part of which you may be interested to hear. After noting the receipt of the memorandum, he said:

"Divinity students are legislatively exempt. Medical and dental students in the fourth-, third- and second-year courses were permitted to escape the first draft and will be permitted to escape subsequent drafts by enlistment in the medical reserve corps. It will be possible to extend similar treatment to engineering students, but as yet there has been no demand made upon the War Department that would indicate there was any great necessity for extending the operation of this regulation to engineering students. Nothing has been heard from the Chief of Engineers on the subject and only in a few instances have schools communicated any desire to have special consideration for engineering students. For these reasons the revised regulations make no provision for engineering students or any other class of technical students except those mentioned above."

It seems to me that if this Association should appoint a committee to consult with Secretary Baker or with the War Department urging the

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points which have been made here, favorable action might be secured. This matter has also been brought to the attention of the National Research Council, which has been asked to attempt to secure the placing of the scientific experts and instructors of the technical schools of draft age in class 3 instead of in class 1.

THE CHAIRMAN. Doctor Capen certainly has touched upon a matter to which we should give immediate attention. Might we not appoint a committee to call upon the Secretary of War to express our feeling, or pass resolutions for presentation to the general session looking towards the appointment of a more representative committee. It might be possible to suggest that if students were not exempted from the draft, some arrangement might be entered upon by way of extension of time until their graduation, provided no new emergency arises which demands earlier service.

G. W. BISSELL of Michigan. I move that it is the sense of this division that engineering students whose names are on the draft list should be granted a furlough from military duties until they complete their studies, so be it that they do good, conscientious work; that instructors in engineering subjects of draft age should be deemed to be listed in the third class; and that a committee of three be appointed to cooperate with a committee from the Association as a whole in adequately setting forth this point of view to the proper authorities.

S. P. CAPEN. It should be understood that engineering students thus furloughed should be allowed to remain in college only on the endorsement of the institutional head as men of promise. This action should not provide a refuge for slackers, intellectual or otherwise.

The motion, being seconded, was carried.

THE CHAIRMAN. The Chair appoints as the nominating committee Deans J. G. Scrugham of the University of Nevada and L. S. Randolph of the Virginia Agricultural and Mechanical College; as committee to prepare a resolution touching student furloughs, Dean G. W. Bissell of Michigan, President W. E. Stone of Purdue University, Indiana, and Professor H. W. Tyler of the Massachusetts Institute of Technology.

On motion, a recess was taken until 8 P. M., Thursday, November 15.

EVENING SESSION, THURSDAY, NOVEMBER 15, 1917.

The division was called to order at 8 P. M. by the chairman.

THE CHAIRMAN. The Association in general is meeting with the engineering division for the consideration of the topic of engineering experiment station legislation. President W. O. Thompson of the Ohio State University will open the discussion.

ENGINEERING EXPERIMENT STATION LEGISLATION

BY W. O. THOMPSON

The purpose of this paper, if practicable, is to set out the present status of the proposed legislation to establish experiment stations in engineering.

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To begin at once, there is general agreement on three points: First, there is great need and opportunity for engineering experimentation; second, that experimentation should be organized in experiment stations; third, there should be federal aid in developing this work.

When we proceed with a program for carrying these principles into execution, points of divergence appear. Some of these are of little importance, but others are considered so fundamental as to develop sharp obstacles.

In the first place there developed a difference of opinion whether the Government should develop one great central experiment station or whether a nation-wide plan seem best after the plan of the agricultural experiment stations. Discussions at various times and places seem to have crystallized opinion in favor of stations in the States in cooperation with the Federal Government as against the system or proposal of a centralized plan. The discussions have assumed that the Bureau of Standards was a most important agency in the movement and should be related to the plan in the States somewhat after the plan by which the Department of Agriculture is related to the agricultural stations.

In the second place the discussions seem to have indicated that there should be required by law at least an equal appropriation by the State as in the case of the Smith-Lever Extension Act. This would probably limit the number of stations to be organized if the state appropriation were a condition precedent. The objection to the plan based on the financial inability of certain States would thus be disposed of automatically, or at least delayed until such time as the State would be able and willing to accept the provisions of the act. It may as well be recognized in all our discussions that the state budgets are not infrequently about all that can be carried until the fiscal systems have been so modified as to make greater revenues possible for education and research. On this phase of the case there is not entire agreement. There are those who emphasize the national interest in these experiments and insist that the local problems should be attacked from a national point of view, even though the State be not financially situated to render much, if any, aid.

There is danger here of having our motives impugned and of being charged with the "pork barrel" tendency. It is well worth consideration on the part of this Association whether a permissive act, rather than a mandatory one, might not be best suited to actual conditions. Doubtless there are States where an engineering experiment station could well be delayed for five or even ten years. The integrity of the system is not involved in its universal and immediate application. Nor should a delay by a State for the time being work to the detriment of the plan. There is always the possibility of opposition in Congress from members where States might not be beneficiaries of the act by an immediate appropriation. The colleges should take the broader view of the matter and be satisfied with a permissive statute leaving the State to determine the time when the statute may be made operative.

In the third place it may be suggested that there is substantial agreement upon the desirability of federal aid, while there is divergence as soon as we approach the question of control. There are two kinds of federal control, namely, legislative and administrative. The difficulties hitherto encountered in agricultural organizations have been administrative rather than legislative. Legislative situations can be debated with Congress and amendments secured. It is with much greater difficulty that legal opinions

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and departmental rulings can be amended or set aside. This is why the colleges and officials of long experience are much more critical of any proposed legislation than are men or officials who view these matters from the standpoint of sound theory, or from the inexperienced or theoretical point of view. These matters of administration are rather vital to the success and permanent harmony of the enterprise. Members of this Association will appreciate what I am saying as I recall the history of one experience. The original Morrill Act of 1862 was a very broad and liberal provision for the Land-Grant Colleges. The whole proposal was so new and so in contrast with the existing order that mistakes were inevitable. These, like most mistakes, were temporary. The development in which both agriculture and the colleges have participated has greatly widened the field of agricultural education and so developed state appropriations that the original Act serves chiefly as a guide and basis for the work of these colleges. The second Morrill Act of 1890 increased the endowment but restricted the uses to which the money might be put. The fact that the prescribed subjects now taught by all agricultural colleges makes the limitation of no practical effect, but it sets up a restrictive principle which enables a government bureau to employ a clerk to check up the integrity and accuracy of the state authorities. It is not necessary here to discuss the motives of those who asked the restrictions. They are pretty well known. In the experiment station acts precisely the same methods have been followed. The Hatch Act was a liberal, generous and broad foundation for experiment stations. The Adams Act introduced just a few slight changes in the phraseology resulting in an authority restrictive in character that opens the way for legal opinions and administrative rulings, the character of which will from time to time depend upon the amiability and intelligence of men selected for their positions on the most general considerations. This Association has spent a considerable amount of time trying to find out its rights and duties. That there has not been serious clashing has been due more to the character of the men interested than to the statute.

More recently the Smith-Lever Extension Act has been the subject of serious debate in this Association. It is a well known fact that this legislation is more restrictive and more specific than any other of the Acts thus far mentioned. There are members of this Association who regard the legislative problems here as well as the administrative problems as very grave indeed. I am not attempting to argue the merits involved but simply to direct attention to the fact that all cooperative enterprises between the Federal Government and the States need to be guarded with great care. It is highly desirable to have experiment stations for both agriculture and engineering, but it would be well to avoid any border line legislation embarrassing to the future.

Turning for a moment to the Smith-Hughes Act in the interest of vocational education let me direct attention to the fact that this measure requires in some States an entire new piece of administrative machinery, such as a State Board of Education in Ohio. At present the Federal Board and the several state agencies are at work trying to develop a plan by which the law can be carried into effect. They have not yet reached the stage of administrative friction or conflicting rulings. One could sincerely wish they might avoid them indefinitely. The Smith-Lever Act on the other hand used existing agencies and became effective very promptly.

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In the discussion of the proposed legislation for engineering experiment stations, it has been proposed to create a state research board composed of the Governor, two persons nominated by the National Research Council and a nominee from the Department of Commerce and Labor. This would introduce three varying factors into the control of the expenditure of funds. Only confusion could result from such administration unless radical changes should occur in human nature for the better. Theoretically such a proposal could be considered, but practically it would fail to be effective. Which one of the three great departments—Agriculture, Interior or Commerce and Labor should exercise the supervisory powers of the Federal Government is not important from the standpoint of theory. It is a purely practical issue to be determined on the grounds of probabilities. In any case it would result in some bureau being in charge of the scientific research of the country. In my opinion this situation is unfortunate. I can not bring myself to a cordial approval of a program that multiplies agencies. At present the Land-Grant Colleges have administrative relations with the War Department, the Department of Agriculture and the Department of the Interior. With each of these we have our troubles; why increase the number?

In this connection, let it be noted that the original Newlands bill (Senate 4874), follows the lines of the original Hatch Act. Experience with the Hatch Act is, therefore, the best guide we have as to the probable working of any similar measure. The Newlands bill has been criticised on the ground that it does not provide adequate supervision and that it fails to define with sufficient precision what research is. These criticisms deserve careful consideration. Does the experience of the Association warrant the belief that the Federal Government should tighten up on its supervision in dealing with the institutions founded and fostered under its initiative? One can see the problem here and the argument for both sides. In spite of all that has been said, I here affirm that the States are more likely to suffer at the hands of the Federal Government than the Federal Government is to suffer at the hands of the States. Moreover, the local initiative of the States is an asset worth encouraging. At this critical moment of the World War the country is realizing the high value of the men of initiative. There is yet some value in freedom and local initiative. It has not yet been made clear to me that expert centralized supervision and control in matters of scientific research is either practical or the best method. A certain administrative control of expenditures may be justified, but detailed supervision amounting to interference becomes intolerable.

The other criticism based on indefiniteness in the statements as to research suggests that if we go beyond a comprehensive statement or invite an interminable academic debate between representatives of the two governments we finally are bound by legal decisions, even worse than the disputed terms. Personally I should say that any of these bills should be accepted on that score and that our debates be confined to the problems of administration.

The Smith-Howard bill proposes that the legislature of each State shall designate the institution best equipped to conduct the work proposed and that this designation shall be approved by the Secretary of Commerce. Nothing is said as to what shall happen if the Secretary of Commerce should withhold his approval. The inference is, however, that the legislature would have to change its vote or the proposal would fail. This

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puts the final authority outside of the State and would seem to open the case, when disputed, to an appeal. If it does not mean this, then the signature is merely formal and has no significance. Either case is undesirable. This method opens up the controversy in every State having separate institutions. On that question it is claimed that the universities are the natural and proper center of advanced work and especially of scientific research; that many of the agricultural colleges are inadequately equipped for such work and manifestly inferior in this respect to the universities. It is further asserted that the men devoted to research would find a more congenial and more inspiring environment at the university, that the future of scientific research is inevitably with the university, and that to assign the experiment station to the agricultural college is to fly in the face of evident tendencies and wrong. It is also affirmed that such an action would tend to develop the college into a university and thus to widen a breach already unfortunately wide. Doubtless some state universities now are in better condition and enjoy more advanced stages of equipment than some agricultural colleges. In all such cases the argument has force and cogency. Doubtless, too, there are colleges where the location of an experiment station would be of doubtful propriety at the present stage of development. On the other hand the following considerations are presented. The assertion that the universities are the proper centers of research is debatable. In some of our agricultural colleges are found men of the very highest scientific attainments. The research men in these institutions would form a very congenial group of men with other men in scientific research.

Moreover, a comprehensive plan as proposed in both these bills should not be judged by the present state of development of either the agricultural college or the university. The fact that the friends of the university fear the development of a second university in a number of States does not furnish a sound basis on which Congress should be called upon to proceed.

On this general issue it may be worth while to say that the States and not the Federal Government are responsible. In most instances, the States accepting the provision of the Act of 1862, acted upon what may be assumed to be their best intelligence. The Federal Government proposed a nation-wide measure of aiding education. The legislatures were left free from any pressure by the Government. Indeed, the Government was liberal or free enough to permit the States to divide the funds and establish agricultural colleges separately for the negroes. Having this liberty and having exercised the right of choice, certain States decided to make the institutions receiving federal moneys, separate institutions. These States also provided for state universities, or, having them, decided against locating the agricultural college at the university. It does not seem logical at this date for these universities to appear in opposition to the Federal Government when a proposal is made to develop the institution it helped to found. That question has been settled. The Federal Government proposed the establishment of colleges—the States in the exercise of their choice accepted the proposal. The agricultural college at that time was a new venture and not very popular. Sneers were more frequent than cheers. Now these colleges have grown in usefulness and in resources. Their students have increased, their faculties are respectable groups and the people of the State are increasingly appreciative of their work. The Government has once and again increased the annual appropriation in

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addition to the original land-grant endowment. The experiment stations have enjoyed a similar increase in revenue. Now in the day of ascendancy along comes the separate state universities with a protest against the further endowment of the federal institutions by the Federal Government. The States have had their day in court. If they made a mistake, they must abide by it. On the other hand, if the Federal Government should yield to this protest and divide its allegiance as represented in its appropriations, then Congress, just like the state legislatures, would be the unfortunate participant in the rivalry now existing in the States. Separate boards of management would appear before both Congress and the state legislature in search of funds. The unhappy division would be intensified. There would not seem to be any good reason why the Federal Government should be a party to this controversy. If the matter should be left for decision to the several States, it is easily conceivable that in States having separate institutions, the result might involve all the future. At the outset it was a very simple and direct method to leave the States free to act as their judgment dictated. To open that question after 50 years of experience would seem at once to reflect upon the federal institutions and introduce a permanent division between the forces of the two classes of institutions. Aside from the theoretical objections available there are some very practical considerations that need attention. In prosperous States it is perfectly possible to develop two important institutions. This fact seems to have been overlooked by many people. In Ohio the University has grown up in the presence of more than 40 colleges and not one of them has been damaged by the growth of the University and its budget. The State now supports four normal schools, two colleges, an industrial division of a university for negroes and the State University. Every one of these is better supported now than 20 years ago before the State University had attained its growth. Michigan has a prosperous university, agricultural college and normal school, to say nothing of its school of mines and a recently organized additional normal school. Indiana has two prosperous institutions not mentioning the normal school at Terre Haute. So of other States. In fact there is a serious problem in the mere bigness of institutions. It is not entirely clear that one great central institution is the *summum bonum* in education. The fear, therefore, of the location of an additional experiment station at the agricultural college is probably no better founded than the other fear that the division of the federal appropriations would frustrate the educational plans of the universities. It may be pertinent to hark back to history and recall that where the first Morrill bill was vetoed by President Buchanan, he and others argued that it interfered with the autonomy of the States. Many other dire results were prophesied that happily never were realized.

The other destructive feature of the Smith-Howard bill is that which makes the Bureau of Standards the supervising agency of the Government. This does not seem to me to raise any vital or fundamental issue. The Bureau of Standards is probably the most important experiment station in its field in the world today. Its sympathy with the proposal may be assumed and its scientific competency as well. The problems here, if any developed, by a large majority would be administrative.

Before summarizing, it may be noted in passing, that as a war measure, we have The American University Experiment Station here in Washington in which scientific men from all over the country are at work on problems

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related to the war necessities. This is a clear demonstration of the fact that the local initiative and power developed throughout the country is an immense asset in these trying times. Important as the central station may be, it needs the help and cooperation of scientific men everywhere. The argument against local stations would appear to have a complete answer in our experience.

To sum up the situation briefly:

1. It is obvious that so long as the forces in some of our States divide, no bill will be passed. Either side can defeat the bill and neither side can pass it. Congress will always find a way of escape if the educational forces divide. The exception would be when a great national emergency existed and the majority part would take it up as an administrative measure. The present proposal will mainly fall in that category.

2. It does not seem quite fair that state controversies should be made the basis of federal legislation.

3. The inadequate equipment of any number of institutions is not a proper basis for legislation. Inadequate or incomplete equipment is or has been characteristic of all growing institutions. It is a passing phenomenon.

4. It may be proper to direct attention to the fallacy in the assumption that the benefits derived from the location of an experiment station are confined to the institution having jurisdiction. In fact the chief benefits do not accrue to the institution at all but to the people as represented in these industries.

5. It is not quite historically true that research is a university function. Some research of the highest character is not carried on at universities but in connection with manufacturing concerns. The Government has research institutions now apart from either college or university. It has a number associated in the agricultural colleges. There is nothing in our experience that would give the exclusive right of research to any one class of institutions as against another. The question then becomes one of sound public policy.

6. Inasmuch as an experiment station is a research institution rather than a teaching institution and its value to a teaching institution lies in its aid and stimulus to scholars and their teaching, no final and exclusive claim can be made either by the agricultural college or the state universities. Either would benefit by its presence and neither would be at its best without the spirit of research in the faculty.

7. Finally the burden of proof lies with the protesting States asking the Federal Government to depart from an established policy. It seems to me that such a request might more properly come up to Congress from the State itself than from the interested institutions. The establishment of experiment stations is a matter of public policy rather than of institutional policy. Since the public must bear the expense and reap the rewards, the agencies represent the State in carrying out policies determined upon in a joint enterprise sanctioned by legislative action. The logic of the situation would then seem to be that the Federal Government proceed with its policies until the States decline to participate. No State should be forced to participate in the establishment of such stations, nor should a State feel aggrieved if by its own action it has created a condition whereby it can not cooperate in a nation-wide movement, because of internal controversies. The State still has ample power to direct its own legal affairs. The local institutions may, by their unhappy divisions, succeed in condemning them-

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selves to death, but they will not be able to elect themselves unto eternal life.

THE CHAIRMAN. President R. A. Pearson of the Iowa State College will continue the discussion.

ENGINEERING EXPERIMENT STATION LEGISLATION

BY R. A. PEARSON

I represent an independent Land-Grant College situated in a State having a strong separate State University. An engineering experiment station has been in operation for a number of years at the Land-Grant College, under the authority of state law, and supported by state appropriation. I know something of the benefits of engineering experimental work, and it seems to me that in many of our discussions we are measuring the importance of this subject by too short a yardstick. Considering the vast interests involved, the tremendous developments which are yet to be made, we should be willing to admit now, in the early period of the development of the engineering experiment station idea, that in time to come, quite likely within the very near future, there will be many engineering experiment stations throughout the country, some of which will be very large, well equipped and generously supported. Doubtless the Bureau of Standards, great as it is, will become still greater and more important. I see no reason why we should hesitate to consider the development of this movement because the movement has already made a good start at some few points in the country.

It is very difficult to add anything to what President Thompson has so well said. He has been closely connected with this subject for many years, he knows it as well as any man knows it, and he has a way of putting his thoughts in very concise and complete form. I will comment on only one or two of the points which he has made. I was pleased to hear him emphasize what is so well known to all of us, that the educational institutions have no exclusive rights on the subject of investigations. In the field of engineering, particularly, many very important investigations have been made and now are being carried on by private institutions and by private individuals. Some of these have small capital and very limited equipment and nowithstanding these limitations are securing good results. I am sorry to hear speakers repeatedly refer to the land-grant institutions as Agricultural Colleges. In this they follow an incorrect usage of many years. I doubt not that arguments against engineering experiment stations at the Land-Grant Colleges have been helped greatly by the use of the term "Agricultural College"; not that that term means anything derogatory to institutional standards, but it very clearly connotes a limitation of the field. Would you call Purdue University an agricultural college? Is it right to call any institution by the name of one of its important parts? This habit started when the Morrill Act was under discussion in Congress; it was continued in various legislatures; and in some States it has been carried to the point of calling the land-grant institution legally the "Agricultural College"; but a review of the lines of work that these institutions are doing and of the graduates, as a class, is sufficient proof that the title is too narrow and misleading. It does not mislead any person in this room. It is a title of honor with us. But many persons who are connected with

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congressional affairs and who are influential with Congress, have very little conception of the different groups of educational institutions in the country, and of their scope and to those persons the term is misleading; and I say again, its use is harmful to the interest of the Land-Grant Colleges in seeking to secure the establishment of engineering experiment stations.

It may be true that the Newlands bill as it has been presented cannot pass, because it is opposed by the separate State Universities and that the Smith-Howard bill cannot pass because it is opposed by the independent Land-Grant Colleges. It is of the highest importance that we get together.

It is important for various reasons that the principle which has become so well established, of government appropriations for educational purposes and for research purposes, should continue to be expended through the land-grant institutions. That subject has been argued and reargued many times.

Recognizing that principle it seems to me reasonable that representatives of this Association might meet the representatives of the separate State Universities—and so far as I know they are the only ones who are opposing the Newlands bill—on a bill which would provide definitely that the federal appropriations for engineering experiment stations should go to the land-grant institutions; but, in order to provide that a second experiment station may be established in those few States where engineering instruction is also given in the other state institutions, namely, the separate State University, let it be provided in the federal bill that the federal appropriation shall be available to the land-grant institutions in any State, and only when that State accepts the terms of the federal legislation and itself duplicates the appropriation, placing its funds available for this same purpose at such location as the state legislature may designate. Then it is easily possible for the State of Michigan, for example, to establish with its own funds an engineering experiment station at the State University, and with federal funds an engineering experiment station at the Land-Grant College. If the State desires that both institutions be strong and efficient in their work regardless of duplication, then these additional appropriations logically should be provided at the two places. I think that the argument that federal funds, such as may become available for this purpose, should be concentrated at one place, or at very few places throughout the country, is not sound. We do not need an enormous amount of money to conduct experiments. I was greatly interested in visiting Dr. Pupin's laboratory in Columbia a short time ago, and noting how simple and inexpensive was the equipment which he used in developing the attachment to the telephone which has meant so much to the world.

We need a larger number of well trained minds focussed upon problems in different parts of the country where they will be influenced by different sets of conditions due to their different surroundings and local requirements and due to associations of different groups of colleagues. Sooner or later, the submarine problem will be solved; and when that has occurred we shall wonder why it was not done sooner. If at 48 or 58 places in this country experiments could be inauguarated to serve this Nation in the present emergency, we would be many times as likely to find solutions of some very important problems as we would be if all this work were concentrated in one place and the problem were studied there exclusively.

It seems to me that having presented this matter to Congress several times, and allowing it to languish year after year because of lack of in-

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terest throughout the country, we now have come to the time when we should seek action, when we should impress it upon all concerned that the matter is of importance from the war standpoint. To continue the discussion now, as we have been doing in the past, is much the same, as a friend of mine put it, as endeavoring to present an academic question to a man who has just been stung by a bee. We need a little more ink, a little more letter writing to offset some very misleading letter writing and mimeographing which has been going on of late. If the question is clearly presented, the Congress may be expected to see it in the right way and to act upon it accordingly.

L. S. RANDOLPH. The splendid analysis of this question made by President Thompson leaves very little for me to say. May I, however, call your attention to certain details which have not been presented.

The problem of research is new and has not been thoroughly threshed out. Research can be broadly classified as scientific and economic. A gentleman came into my office a few months ago wishing some data and information in regard to the tractor on the farm. After much conversation the whole was boiled down to the one question, what size tractor should be used. An investigation showed that it had been determined in the West. The tractor should be either above or below the 25-horse power size, the larger machine being too heavy for certain work and too small for other work, while the 25-horse power mechanism fitted well into neither place.

A gentleman connected with the Federal Aviation Board told me last summer that he found great difficulty in getting men away from the economic idea, that, in other words, they failed to appreciate that the economic idea was different with their work than with that ordinarily held. The effect of vanadium, chromium, etc., in steel is what one would call a scientific matter, a determination of facts. The value of these elements in steels in everyday use is an engineering or economic fact, and is quite different from the information desired in the first instance.

The problem of the small industry is primarily economic, the application of scientific data already obtained to the individual economic problem, although problems may arise in the field of economics which necessitate further scientific information.

It is not enough simply to get the information and publish it. It is important that we give it to the man and we must get in close touch with him. Our agricultural friends have been publishing bulletins for years, and while much good work has been done in this way still it is not in the least comparable with the results which are now being obtained by their demonstration agents. They have shown us the way, the way of the personal touch. A small industry is in much the same shape as is the small farm, for the man in charge of the small factory has much the same mental attitude and aptitude as has the man in charge of the small farm. We must get our experimental researches in such shape that he can understand them and appreciate their bearing and be able to fit them to his individual case. This can only be done by personal contact and requires at least one station in each State, which may require demonstrators or the visits of its staff to the industry desiring assistance.

THE CHAIRMAN. The discussion will be continued by Dean R. L. Sackett of the Pennsylvania State College.

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R. L. Sackett. The experience of the agricultural experiment stations speaks forcibly concerning centralization. Their great advantage, as I understand it, is the closeness of their contact with their constituencies, the direct relationship existing between the producer and the user of experimental knowledge. But, some one answers, there is not the same necessity of close coordination in engineering industry, because there are few local engineering or industrial problems. I submit that there are certain local problems arising from local materials and local needs of an industrial or engineering character which could best be served by cooperation between the engineering experiment station and its constituents. The rural community is today facing the need of machine power to replace man power as never before. The Newlands and the Smith-Howard bills deal with transportation, water supply, power and other matters which concern rural communities. Cooperation between experiment station and rural community, even in industrial and engineering lines, will be of growing importance; and there are other local problems which can best be solved by the cooperation of the agricultural and the engineering experiment stations.

President Thompson has traced the historical development of the Agricultural College, which, of course, included the development of the agricultural experiment station, the Morrill Acts and their amendment, the Nelson amendment, the Hatch Act, the Adams Act and the Smith-Lever Act. The States and the Federal Government have cooperated in institutional development, and particularly in that of agricultural experimentation. Now during these 50 years there has come to be a feeling that agriculture and mechanic arts should be similarly treated so far as they are comparably useful to their constituencies. It would seem to be a logical conclusion, historically, that if federal aid to an experiment station is vouchsafed to one side it should be conferred upon the other side of the college as well, provided the worth of the latter is conceded, and no one now gainsays that fact. Those two points seem to me worthy of emphasis.

In my judgment, the Newlands bill, fashioned according to the wording of the Hatch Act, should be carefully considered as to its deficiencies, if any there be, revised as to its details, and presented to Congress as soon as may be. The fact that it may fail is no argument. If it is the right measure in the interests of the whole country, let us introduce it and press its passage with all our energy.

G. W. Bissell. Dean Potter and myself, as joint authors of the Newlands bill in the form in which it was originally introduced and now stands, will not protest if this division thinks it must be amended. In fact, I have come to the conclusion that it needs must be so amended as to secure unity of action on the part of all the forces that favor the establishment of engineering experiment stations.

Referring to President Pearson's statement as to the misnomer attaching to our Land-Grant Colleges; why not raise the question in connection with the name of this Association? Why should it not be rechristened the Association of American Land-Grant Colleges?

C. L. Cory. I was deeply impressed with the presentation of this subject by President Thompson. His paper primarily represents an ideal; and if such an attitude of mind was necessary in the past it is more so today. The Morrill Land-Grant Act made it possible for this Nation to be stronger than it otherwise would have been, not only in agriculture and

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mechanic arts but in the knowledge and training our young men have of military science.

We listened this afternoon to Mr. Herbert Hoover, a graduate of the Leland Stanford, Jr., University, a member of the pioneer class of 1895. For a number of years Mr. Hoover was presumed to be solely an engineer. Is he not more than that? Has he not been made more human by his recent experiences in Belgium? Perhaps so; but we are proud of the kind of an engineer which Mr. Hoover really is. Nevertheless, if you talk with him now you cannot but be impressed with the fact that his is an economic problem closely allied wtih the highest possible human interests.

W. M. Riggs. I think the suggested changes in the Newlands bill wise. It would not be perhaps an impertinence, but certainly it would be idle, to introduce either the Newlands or the Smith-Howard bill with any hope of favorable action. I have talked with Congressman Lever whom Senator Newlands was anxious to have associated with him in the passage of this legislation. Mr. Lever has several times assured me that there is no hope of passing either measure and that indeed, in his judgment, no bill whatever along this line can secure attention during the progress of the war.

These proposed modifications will, I believe, bring to us the instant support of the separate State Universities, because in them they would see a possibility of securing an appropriation equal to the federal appropriation which would go to the Land-Grant College. Under the Newlands bill there is no chance for that whatever. The Land-Grant Colleges would probably be willing in some States to see the separate State University secure a state appropriation in order to insure to themselves the federal appropriation.

If state appropriations were made an absolute prerequisite to the acceptance of the federal appropriation, I should fear the outcome in some of our Southern States which have not as yet acquired the habit of giving liberally for education and research.

The Secretary. I move that the incoming chairman call a meeting of members of the division tomorrow morning to revise the Newlands bill, with a view of submitting the revised copy to the Association before its adjournment; and that the Association be urged to authorize its Executive Committee to approve the bill so that it can be presented to Congress at the earliest practicable date.

The motion, being seconded, was carried.

C. A. Lory. I rise for information. Should this proposed action be laid before the general Association? This is a question of public policy which requires the assent of the section on college work and administration as such.

The Chairman. The Constitution simply says that nothing shall be be done by the Association as such without the assent of the section on college work and administration. The statement, in effect, is that the general Association may take this action, but it cannot be put into effect unless the section in question approves the action of the Association. I assume, however, that the Executive Committee will consider the whole proposition.

Dean O. V. P. Stout of the University of Nebraska will now discuss "Agricultural Engineering in the Land-Grant Colleges.".

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Agricultural Engineering in the Land-Grant Colleges

By O. V. P. Stout

It is proposed to make this paper a review touching upon the status, accomplishment and prospects of agricultural engineering in the Land-Grant Colleges. The review will not be rigidly statistical but will be somewhat general in its nature. It is based on my first-hand information of and contact with the work practically from its inception, and on supplementary knowledge gained from replies to letters of inquiry addressed recently to institutions in which the work has become established on a scale of greater or less magnitude. The inquiry has embraced Canadian institutions also.

The term "agricultural engineering," as employed in the title of this paper, is the one adopted by a large majority of institutions. "Farm mechanics" ranks next in favor, "farm engineering" is used in at least one instance, "and rural engineering," the term employed by the United States Department of Agriculture, and which to my mind is the one of those used that most completely comprehends and clearly defines the field, is found at Cornell University. The only term which I can suggest as an improvement on "rural engineering" is "rural mechanic arts," with a parenthetical addition "including engineering," in those cases where work is done on the plane of engineering as defined by the engineering division of this Association in its excellent official definition of engineering as "the professional phase of mechanic arts." It is rarely possible to conduct the work on the professional plane except with engineering students or in research.

Agricultural engineering is administered as a separate department in all but a few of the institutions in which it is given extended consideration. The exceptions are those cases in which it is included in the department of agronomy. In several instances the change has been made from the department of agronomy to the basis of a separate department. The instruction is generally provided primarily for students of agriculture, both collegiate and secondary, and in the short courses. The generally authorized aim is to contribute to the production of better farmers, better farming methods, better farm establishments and better farm management. Even the few institutions which provide for the training of professional agricultural engineers can scarcely say that this is the primary aim of the department or that the provision of such training calls for the major part of the effort and expenditure.

The exceptions to the rule that mechanic arts and engineering in relation to agriculture are administered wholly within the division of agriculture are few. In North Dakota the work is wholly in the school of engineering. Where professional courses in agricultural engineering have become established, as at Iowa and Nebraska, they are in the engineering division, leaving the purely mechanic arts phase of instruction to the supervision of the agricultural division, which furnishes nearly all of the students for that phase. The engineering divisions do not concern themselves regularly with the extension work of the department. The research work is a matter of joint interest and the immediate supervision may fall to the one or the other division, according to the source of suggestion, the department cooperating, or other circumstance.

The subjects handled in the departments of agricultural engineering

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may be classified into four groups, consisting respectively of those related to the mechanical engineering phase of the work, those related to the civil engineering phase, those which are purely of the nature of mechanic arts and those of a miscellaneous nature. It will be noted that I have included under civil engineering the structural subjects which are more or less of an architectural nature. An attempted enumeration of these subjects by groups is as follows:

Group A—Mechanical Engineering: Farm tractors, farm machinery, farm motors, power transmission apparatus, power driven machinery, horticultural machinery, dairy mechanics and machinery, automobiles.

Group B—Civil Engineering: Farm structures, rural sanitation, rural water supply, farm surveying, rural concrete construction, irrigation engineering, irrigation practice, drainage, land clearing, prevention of soil erosion, highway engineering.

Group C—Mechanic Arts: Rope work, babbitting, soldering, carpentry, blacksmithing, belt-lacing, pipe-fitting, farm repairs, road building and maintenance, drawing.

Group D—Miscellaneous: Farm mathematics, applied physics, lighting, heating, ventilation, farmsteads, efficiency of arrangements and operations.

The subjects in Group A are quite generally conceded by other departments to agricultural engineering. At one college, however, instruction in the use of stationary farm engines is given by the department of mechanical engineering and at another the same department is said to be reaching out for the tractors. The automobile work is also sometimes found in the department of mechanical engineering, and the subjects of horticulture and dairy machinery, which have been mentioned in a few of the letters which I have received, are probably, as a rule, taught and otherwise exploited in the departments in which the machinery is used.

The subjects in Group B are not so generally conceded by the civil engineering departments to agricultural engineering. I believe that in the majority of instances they should be so conceded in order to insure effective and sympathetic treatment. Exceptions may be noted in the cases of drainage, irrigation engineering and practice, and highway engineering, in those institutions in which special attention has been given to these subjects for a long time prior to the creation of the department of agricultural engineering and in which, in some cases, there are departments devoted solely to these special subjects.

I believe it is a fact, as claimed by some of the workers in agricultural engineering, that they have to contend in general with a lack of understanding and appreciation of their work on the part of their superiors in authority, and also on the part of their colleagues, of both the engineering and the agricultural sides. I think that all engineers will realize that there is in themselves a disposition to be more interested in the phases of their subjects which relate to larger problems and undertakings than are, for the most part, usually encountered in agricultural engineering. The case of drainage will illustrate my meaning. The civil engineer becomes interested in large works of drainage and in connection with such works can command fees which justify him in maintaining an urban office and in traveling considerable distances to the sites of projects. Under such circumstances he is not disposed to take a very great interest in the drainage works of the individual farms, one at a time. The teacher of civil en-

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gineering also finds that the larger works of drainage appeal to his interest much more than do the smaller works of the individual farm. In order that the smaller work may receive the attention which it deserves in study and teaching, it should be in the hands of a man whose primary interest lies in the smaller work, and he is found in the department of agricultural engineering.

The establishment of instruction in agricultural engineering naturally suggests that work in research and experimentation or extension is to follow, after the manner of the organization in agriculture. Experience to date seems to indicate that this research and experimentation are somewhat difficult to establish, as they require the apportionment of considerable amounts of money for which there is a large competing demand. The movement toward this branch of the work seems, however, to be gathering strength. The new buildings for agricultural engineering provide for experimental work, and the plans of the departments include the addition of experimentalists to the staff. Agricultural engineering in extension meets with a ready response from the farmers. In one State, the man in charge of county agents has emphasized proficiency in agricultural engineering as one of the three essential qualifications for a county agent. In Nebraska the services of no extension worker are more in demand than are those of the specialist in agricultural engineering. A striking contrast of the situation appears in that so far as instruction is concerned, the demand has been greater for the mechanical engineering than for the civil engineering phase, and to a large extent the students and graduates who enter employment based chiefly on their work in agricultural engineering find themselves in situations where the demand is made on them for the mechanical engineering rather than the civil engineering subjects which they have studied. In extension, on the other hand, the civil engineering subjects are, on the whole, the ones in which greater interest is taken and for which there is the greater demand.

The agricultural engineering departments in the various institutions have usually started on the basis of instruction in mechanical engineering subjects. The demand for the civil engineering subjects has normally come later.

Large buildings designed for and devoted exclusively to agricultural engineering are rare. So far as they have come to my knowledge, they are: the building at Minnesota, the one at Saskatchewan (Canada), and the one under construction at Nebraska. Such buildings are, however, in immediate prospect at one or two other places.

The maximum value of the owned equipment which has been reported to me is about $26,000. Loaned equipment in the form of tractors, engines and farm machinery has reached as high as $50,000 value. All of the institutions report cordial relations with the manufacturers of machinery for the farm. A number of them take pains to point out that there are individual manufacturers who are not cordial and who refuse to cooperate by loaning their products.

The departments or sub-departments of agricultural engineering in the Land-Grant Colleges have enlivened and strengthened the instruction of agricultural students. Courses in drawing are especially effective to this end. At Iowa State College a course in curve plotting, diagrams and picturegrams, as applied to the representation and analysis of scientific and statistical data, has been given to freshman students of agriculture,

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with pronounced success and with decided benefits in the later work of the course.

The four-year professional course in agricultural engineering has been the subject of considerable discussion, with apparently a majority adverse to the proposition. The best adverse argument which I have seen is that advanced by Professor John T. Stewart, the head of the agricultural engineering division at the University of Minnesota, in a paper which he wrote in 1912. He argues that "Agricultural engineering is a composite term referring to work handled by an organization, the members of which are thoroughly specialized engineers with a practical and intimate knowledge of farm conditions, who are working in government and state institutions in experimenting, collecting data, and interpreting and applying engineering principles to the development of agriculture; this information to be distributed to local engineers and agriculturalists rather than put into practice by the agricultural engineers themselves." We may infer from his presentation of the matter that there is properly no such thing as an individual professional agricultural engineer and that training purporting or aiming to produce such is misdirected. While I do not like the sound of that statement, I am not sure that my reaction on it does not result chiefly from the fact that he has used somewhat different phraseology than I should have employed. My ideas on this point were presented in a paper before the engineering section at the meeting in November, 1913, in which I emphasized the division of engineering in relation to agriculture into a primary and a secondary field, the truly rural engineer, with an extensive rather than an intensive training, occupying the latter and the specialized engineer, of whom Mr. Stewart speaks, occupying the former.

Data concerning graduates in agricultural engineering are as yet inadequate to serve as a basis for other than tentative conclusions. The total number of graduates up to and including the class of 1916 is only about one hundred, the product of two institutions, and the oldest class has had only seven or eight years in which to mature. Professor M. F. P. Costelloe of Iowa State College, and Professor L. W. Chase of the University of Nebraska, have compiled and arranged for presentation and analysis the data in regard to these graduates. A noticeable but easily understood feature is that a considerable percentage of them have engaged in college teaching of agricultural engineering. It is, of course, the newness of the subject as an item in college offerings and curricula and the rapid growth of the interest in it that explains the relatively large proportionate demand for teachers. This might naturally be assumed to be a more or less temporary phase of the situation but if four- (or five-) year courses in agricultural engineering continue to be offered by only a few institutions, if the demand for agricultural engineering instruction, experimentation and extension continues to increase, and if the favor which has been shown to agricultural engineering graduates as teachers, experimentalists and extension workers in agricultural engineering suffers no diminution, the phase may be permanent.

The data prepared by Professors Chase and Costelloe reflect the same wide range of adaptability of engineering training which appears on analysis of the occupations of the graduates of other engineering courses. There are farmers, bankers, salesmen, manufacturers, contractors, promoters, teachers, editors and others, as well engineers. As to the engineers, it is

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not entirely clear that either Professor Stewart's specialized engineer has appeared in the primary field or my rural engineer in the secondary field, but I believe that both are present and that it is not yet time to abandon the logic of that scheme of things. One thing that does appear with certainty in the showing of graduates is that their activities and their compensation compare favorably with the status and accomplishment of graduates of the same period in other engineering courses.

Just as in the other industries it has developed that the engineers have been pioneers and the most effective workers in the efficiency movement, so it appears that the agricultural engineers in the colleges are attracted by the opportunities for study and progress along the lines of efficiency in the farming industry and have already contributed materially to development along that line. As the colleges are organized there is perhaps danger that in this they may trespass upon the province of the farm management departments. As an illustration of the affinity and capability of the engineer for this line of work we may be reminded that the very successful professor of farm management in one of the largest universities took the greater part of his undergraduate work in engineering and that his methods and reports show constantly distinct evidence of his engineering training.

Some of the men who are engaged in the work of agricultural engineering instruction feel very strongly that its development in a majority of the colleges is not commensurate with the importance of the subject. They point to some of the ablest teachers who have forsaken that work for commercial engagements, not so much on account of better salaries offered as on account of what they have considered inadequate support for their college work.

The educational committee of the American Association of Agricultural Engineers has recently made an extended investigation of college work in agricultural engineering, particularly farm machinery, taking into account the status, facilities, methods, relations and personnel. A review of some of the material collected and comments made by the committee results in the conclusion that although the status which has been reached by the work in many of the colleges in a relatively brief period constitutes a distinct achievement, it is due to improve materially, as it is not yet commensurate with its inherent importance as a basic element of modern agriculture. With due recognition of the importance of the work will come improvement in facilities, methods and relations. Criticism of personnel has arisen chiefly from the circumstance of attempting to do the work through the agency of an engineer who lacks agricultural knowledge and sympathies, or, on the other hand, through one who, however much attached to and proficient in agriculture, lacks engineering knowledge and training.

In conclusion, it is submitted:

(1) That agricultural engineering has acquired distinct recognition and considerable standing in at least half of the Land-Grant Colleges, but has not been accorded, except in a few instances, the recognition to which its importance entitles it. Progress toward proper recognition is being made, although not at a rate to satisfy and hold some of those now identified with the work.

(2) That generally augmented appreciation is warranted on the part of deans of engineering and agriculture as well as heads and governing boards of institutions.

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(3) That there seems to be no present danger of the professional agricultural engineering course being put into effect in a sufficient number of institutions to more than meet the substantial demand for graduates of such courses.

(4) That the work should be offered and adequately supported for the benefit of all grades of agricultural students in all Land-Grant Colleges.

C. A. Loav. The establishment of courses in rural engineering represents an effort to mobilise the engineering resources of the Land-Grant Colleges and Universities for service in agricultural development, and is the result of an insistent and growing need. This need is regional for men technically trained in what may be termed the application of engineering practice to the problems in agriculture, to serve as teachers, investigators and extension workers; and institutional for courses for farm machinery, highway construction, irrigation and drainage, farm buildings, etc., for investigators along similar lines and for extension work.

The need for technically trained rural engineers is well met by institutions like Iowa and Nebraska, where well equipped departments of rural engineering serve as connecting and correlating agencies for the divisions of engineering and of agriculture, these bringing to the students the facilities of both in resident study, in investigation and in extension service.

The institutional needs for resident instruction, investigation and extension service in rural engineering are met with varying degrees of effectiveness in colleges where departments of rural engineering have not been established, generally through the division of agriculture with more or less cooperation from the division of engineering. The efforts to enlist the interest and the cooperation of the engineering faculty in teaching courses in rural engineering are often met with disappointment. Investigations relating to farm machinery, the use of mechanical power on the farm, transportation, etc., have not had a strong appeal and engineering service in agricultural extension has not met with favor. In fact the attention of the engineering faculty has been focused on the training of technical engineers and on the problems of the manufacturers. This has resulted in the forced assumption by the division of agriculture of much work that should be done by the division of engineering. It has resulted also in limited and often unsatisfactory institutional service and in arresting the development of the engineering division. It is encouraging to note that the engineers themselves recognize this condition and that they are setting themselves the task to remedy it.

There seems to be general agreement that the need for technically trained rural engineers is not sufficient to justify each and every land-grant institution to undertake such training, but the need for better institutional service in rural engineering is common to all and is growing more insistent daily. Better service in meeting this need through more complete mobilization of engineering resources for agricultural development requires two factors: First, a correlating agency in each institution with proper authority to outline and unify the work and make full use of the facilities of the divisions of agriculture and of engineering in resident instruction, investigation and in extension activities, a correlating agency which may be either the department of rural engineering or a planning committee; and, second, a different point of view on the part of the engineering division, a willingness to approach this work from the standpoint that has been so largely followed in agriculture, and a firm determination

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to assume full responsibility in this important field of agricultural engineering service and to push the work vigorously and aggressively.

W. N. Gladson of Arkansas. I cannot add to this discussion from actual experience with agricultural engineering courses, for the reason that no such course is offered at the University of Arkansas. In its very early days (1876) certain courses called "agricultural engineering," "farm mechanics" and "rural architecture" were listed in its catalog. These were taught to agricultural students by the department of mechanical engineering. It was difficult at that time to interest students in agriculture, and in all probability these mechanic arts courses were inserted to enliven the agricultural instruction. We now offer to our agricultural students, mechanic arts courses in mechanical drawing, shopwork, rural architecture, land surveying, leveling and farm drainage, and other courses are open to them by election. It is our policy to give instruction in any line in which there is a real demand from the industries of the State, but we have waited for the demand to be created by state industries instead of offering courses with the hope that developing industries would find use for them.

There is practically no power machinery being used today in Arkansas farm operations, our farms being organized and managed under the old regime. A plantation located either in the Mississippi, White or Arkansas River valley is divided up into small tracts, of from 15 to 40 acres each, and leased and farmed by a negro family with hand tools, a mule, and, probably, a double-shovel plow. Whenever our agricultural brethren shall have so revolutionized southern methods of farming that machinery is actually used in farm operations, then I presume we will organize courses similar to those that are now called "agricultural engineering."

I agree with the author of the paper that the demand for professional agricultural engineers is small and is likely to remain so for many years and that the institutions now equipped for training these men will suffice for many years to come.

I am more interested in finding out what we of the smaller institutions may best do in training agricultural students in mechanic arts than in developing a professional course in agricultural engineering. The average farm is small, a one-man farm, operated by the farmer and his family. Now that farmer or some of his boys ought to know enough about mechanics to enable them to operate, maintain and repair the farm machinery. I believe that we ought to try to give our agricultural students such training in mechanic arts that they will be able to do this; that it were better to graduate them from the College of Agriculture with a reasonable amount of training in mechanic arts, than to attempt, now, to introduce even a two-year course in agricultural engineering for which there is small demand.

Agricultural Engineering at Land-Grant Colleges[1]

By A. M. Soule

The trend of population towards urban centers is one of our most disconcerting economic problems. The increment in total population between 1880 and 1910 was 83.3 percent. The percentage increase in the number of wage earners in manufacturing industries was 42.1 percent; in agriculture, only 79.7 percent. During this same cycle the growth in

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urban population was 188.5 percent and in rural population, 39.4 percent. The result of this tendency of our people to congregate in urban centers has been a reduction in the per capita production of staple food crops. In the era from 1876 to 1884 our annual per capita output of wheat was 8.5 bushels; from 1906 to 1914 it was 7.7 bushels. The same relative decline in the production of food animals is also observed, and, as a corollary of this situation, our exports of foodstuffs and animals have fallen from approximately 20 percent in the decade 1880-1889 to 5.9 percent in 1910-1914.

Even before the declaration of war the United States was becoming less able to feed other countries than heretofore and needed the greater part of her foodstuffs for home consumption. A temporary stimulus to our food production has come about by reason of the unusually high prices towards life in the open country. If this is to be accomplished we must make them see and appreciate the opportunity which farm life affords, not only for obtaining a desirable livelihood but for the establishment and maintenance of a proper equilibrium between the production of raw materials for manufacturing purposes and for use as food.

The present war seems to indicate that the strength of a nation primarily centers in its ability to balance all its industries and to become as nearly self-sustaining as possible in the matter of its food requirements. The economic drift of the present moment, if allowed to continue, is bound to weaken the United States as a producer of raw materials and to aggravate the cost of living to an unbearable degree. This will bring about friction between employer and employee, increase the cost of manufactured goods to a point where successful world competition becomes difficult and result in the over-congestion of our urban centers with a population less virile than that found in the open country.

These issues are of such vast importance to our welfare that their consideration can not be lightly dismissed except by the uninformed. It is manifest to all students of economics that the present movement towards urban communities and the neglect of the open country will continue as long as our Government and our industrial enterprises continue to pay the scale of wages now prevalent in most localities. It is not reasonable to expect a farmer with a labor income of $500 or $600 a year to continue to operate a small farm in view of the difficulties and discomforts he must daily face when a nearby industry is offering him $1,200 to $2,400 a year to move from the country into the tenement district of the city where he can, as he and his family think, enjoy all the so-called delights, recreations and privileges of an urban center. Our people are not sufficiently well organized or educated as yet to be able to discriminate clearly between relative values and to realize what constitutes real opportunity. At present we seem to have unfortunately placed a premium on living in the city. Our Government, being a democracy, has not felt that it could repress our national desire to gather in great centers, and so nothing has been done or is being done to check the cityward movement until now we are threatened with an actual depopulation of the country in many localities, together with all the ills which flow from such a disrupting policy.

Starting in 1776 as an essentially rural nation, it never seemed likely that we would at so early a stage in our history be metamorphosed into a people composed so largely of city dwellers. We have up to the present time been dominated by a strong and virile rural population. It is from

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that source that we have drawn our constructive leaders in practically all walks of life. Our large rural population has seemed to constitute a sort of balance wheel and provided an apparently inexhaustible source of reserve energy for the use of the Nation. Most unprejudiced observers state that our rural population has been chiefly responsible for molding public opinion along constructive lines and preserving those national ideals handed down to us by our forefathers in which we take such just pride. Anything which tends to lessen the numbers of our rural population, or to minimize its vigor of body, its independence of mind, its clarity of vision, its wholesouled patriotism and its unremitting devotion to toil, strikes at the very foundation of our existence. Is it not time to pause that we may consider ways and means by which our country life may be sustained and nourished in the highest degree of efficiency? Surely something can and must be done to check the present movement, for the issues involved are of sufficient magnitude to engage our active sympathy and consideration at this moment of national crisis.

No doubt you are familiar with the fact that many German savants attribute the strength of their nation to the wholesome peasantry upon which the German government has spent its best thought and energy for so many years. You recall the propaganda of these same men spread abroad to the effect that Germany must take and hold enough of the rich alluvial lands of central Europe to enable her to expand her peasantry to the point where at least half of her population, which is to finally become 200,000,000 people, will be engaged in agricultural pursuits. According to these German leaders, the strength, the morality, the hardihood, the will to achieve and overcome the difficulties and obstacles which beset the pathway to success, are more strongly entrenched in the souls and hearts of her peasantry than of any other part of her population. It seems to me that they have reached the proper conclusion with reference to this matter, as revealed both by history and a study of the economic principles involved in establishing and maintaining the commercial and industrial supremacy of a state and nation.

Our task, therefore, seems to be that of keeping in the country the greater portion of our people. If we succeed we will possess a virile, aggressive, clear-eyed, stout-hearted, strong-limbed rural population upon which we can lean in any emergency. From this source we can then draw from time to time, as the exigencies of the situation require, clear-headed men of keen vision and invincibility of purpose to formulate new plans and policies calculated properly to safeguard our destinies. If we are to accomplish this end we must transfer in large measure the facilities of the town to the open country. What do these include? They include modern homes, not expensive but built with the idea of permanency, convenience and sanitation, provided with light, water and sewage systems. The soil is the original source of wealth and those who cultivate it are entitled to the best the city affords. They are amply able to have it if they manage the land with a proper degree of skill and care. They are certainly entitled to something better than the shacks and cabins in which many of our farmers now exist rather than live. It is self-evident that the great majority of our country homes, churches and other public buildings must soon be replaced by something more nearly suited to the needs of our present day life than the structures now in use. We are fast emerging from the pioneer stage of agriculture in America. The type

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of home we construct in the country in the next few years will exert a far-reaching influence on the general character of our civilization.

People living in the rural districts must have good roads in order that their homes may be accessible to towns and cities by auto transfer. Good roads will also tend to bring the town and city closer together, extending the benefits of the one to the other in a mutually helpful degree. There must be in the country a system of consolidated schools. When this is done, vocational training, as it pertains to agriculture and home industries, can be placed on a basis worthy of the two essential causes represented. Training can be given in such schools which will make the home-maker and the land-owner more proficient in their callings. This will materially lessen the present marked tendency to move away from the country to escape its so-called isolation, ennui and lack of opportunity.

The farm of today, if profitably operated, requires much special equipment. The time when any sort of a barn will answer is past. Specialization in agriculture is now necessary and a dairy farmer cannot operate successfully with the equipment suited to a tobacco or truck farm, or vice versa. And so it has come about that a great variety of barns and other outbuildings are required on the modern farm. These buildings are different from those in use by industrial concerns and their construction requires a special study of many factors and conditions if they are to be economically built and prove satisfactory after their completion. Many farms also require to be drained; where the land is rolling it must be terraced; and in many sections of the country, irrigation is essential to the success of an agricultural enterprise.

How are these things to be accomplished? Do they call for a new type of farming or for a new type of farm adviser—a specialist in agricultural engineering which up to this time we have not developed in numbers proportionate to the needs of our primary industry? We have rocked along since Independence Day doing the best we could on the old farm. We have managed to dig much wealth out of it. We have built up a great fabric of commerce and industry by main strength and awkwardness. We have wasted more of our natural resources than we have conserved. We have abused the soil until it has become thoroughly disheartened, and, in many instances, has taken "French leave" and joined our rivers on their way to the sea. Now we are face to face with the thankless task of trying to restore and rebuild what our forefathers and we ourselves so consistently have endeavored through mismanagement and ignorance to dissipate and destroy. To accomplish the restoration of our soils to a state of fertility even approximating that of a century ago, will call for all the strength, fortitude, industry and energy which our people can summon to their aid through every resource of education at their command.

We are also face to face with another question of rather recent origin. I refer to the problem of labor. There was a time when a hired man could be obtained for a few dollars and induced to submit to any sort of treatment without complaint. There was an abundance of this type of labor when I was a boy; but all that has been changed by recent industrial developments and now the farm laborer is becoming something of a rarity. With his disappearance from the scene, the maintenance of our agriculture on a basis calculated to supply our needs has taken on a new character which calls for the extensive and continued use of a great variety of more or less complicated machines. To some people the operation of machinery

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is a simple thing, but to the vast majority it is a nightmare. As there is no likelihood of there being an abundant supply of farm labor available for some years to come, if ever again in the degree once witnessed, the use of machinery becomes a fundamental matter and so there must be developed a class of farm mechanics or agricultural engineers which for the most part is now non-existent. Unless we are able to utilize machinery to the fullest possible extent, the cost of living is bound to increase rapidly, the supply of our raw materials, which we have hitherto had in such abundance for the support of our numerous manufacturing plants, will be seriously curtailed and continuance of our present economic organizations and relationships endangered.

It should be borne in mind that this is not a situation to be faced in the distant future but today; hence the necessity of hastening the solution of this problem with as much expedition as possible. Fortunately in no other country in the world has farm machinery of so effective a type been developed as in the United States. The chief operations on our farms can be performed by machinery with an astonishing degree of celerity and success. The use of machinery, however, calls for a heavy investment on the part of the farmer and a correct knowledge and understanding of the principles of operation involved, which unfortunately we do not possess on a nation-wide basis at the present time. It is true that we are using much machinery but we use it in a destructive manner and cast it aside before we have obtained anything like the full efficiency to which we are entitled from its use. On the other hand, it is evident that through the proper use of machinery we can maintain and increase agricultural production in the United States even in the face of a diminishing supply of farm labor, and particularly of hand labor. Machinery constitutes the determining factor in the agricultural progress of the Nation. It holds the key to the solution of many of our most perplexing farm life problems and is the main factor concerned in establishing the final relationships which shall exist between the country and the city. Everyone who has studied the present situation must realize the truthfulness of this conclusion, for we have already witnessed the complete transformation of American agriculture through the agency of machinery in the last 50 years. Its essential nature in the present struggle is shown by its ever increasing use in foreign agricultural production. Were it not for this enlarged use of farm machinery, some of our Allies in the present war would probably have been forced to capitulate long ago.

If the facts in the case have been clearly stated, it is evident that instruction in agricultural engineering has become an indispensable part of the work of an agricultural college. Even the trucker or the small farmer must be something of a rural engineer, or, at least, must be in position to obtain the service of a man who has specialized in this subject in order to conduct his operations with economy and success. On farms of any considerable size and especially on those operated on an extensive basis, the time is not far distant when an agricultural engineer must form a part of the permanent force. Agricultural engineering, therefore, is bound to exert a very great influence on the progress of our agriculture in the immediate future. It will be definitely related to what we are now pleased to term the high cost of living and will exert a primary influence thereon. It will measure the economic development which our country is to make in the next quarter of a century, and upon the agricultural engineer will depend

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to a large degree the successful solution of the problems relating to the satisfactory nutrition of our rapidly growing population at a reasonable cost.

Doubtless many think that our present engineering courses will train men satisfactorily to perform the duties of an agricultural engineer. In this I feel that they are mistaken. It is as differentiated and specialized a field as one can discover anywhere. Only the man with the proper point of view, with adequate farm experience and possessed of special training and knowledge can perform this service work successfully. As an example, the type of architecture suited to a rural district is separate and distinct from that adapted to our towns and cities. Convenient barns can only be built by those who have studied the individual needs of the land owners. What does the average city architect or engineer know about a modern dairy barn, a tobacco curing house or an incubator cellar? I have frequently witnessed the distortions in towns and cities which pass by the names of homes and which men of this class are said to have perpetrated on an inoffensive public. If these edifices were originated in the brains of men who were thought to be trained as engineers and as architects, it is to be hoped the country may escape the ravages of their fertile imaginations. It is devoutly to be hoped that our Land-Grant Colleges will be able to turn out agricultural engineers and architects who will be able to build structures that will harmonize with the natural beauty of the open country and not prove question marks and eye sores on an otherwise harmonious and unified landscape.

There is an urgent and insistent demand for specialized courses in agricultural engineering. There is equal need for research work along this line. There is a wonderful field of opportunity opened up to our youth in this direction. Up to the present time it has remained practically a virgin field. Through the service of trained men general progress along essential lines can be achieved. To my mind it is the duty and the privilege of every agricultural college to offer specialized courses that will train men to serve acceptably in the field. By so doing they will be performing a service of national importance and will be fulfilling the high national ideal of service and leadership which has ever characterized their activities.

Personally, I believe that when Congress is asked to give consideration to the Newlands Engineering Experiment Station bill, it should be asked to appropriate, in addition to the sum now called for, $15,000 for the promotion of agricultural engineering research in each State. It is time that we recognized the essential service which the engineer is capable of rendering to our agriculture. Why hesitate to appropriate $30,000 a year out of our national treasury to each State in view of the present need of reorganizing our industries and our agriculture and of conserving the efforts of our manufacturers and farmers through the intelligent and skillful use of labor-saving devices?

Agricultural Engineering[1]

By E. S. Keene

Before the days of our present system of technical schools all engineering work of a technical nature was included under civil engineering. The

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military engineer and the civil engineer were practically one. There were no text-books as we know them today and systematic instruction in engineering was not to be obtained. Technical engineers were developed in the offices of other engineers.

Sibley College, at Cornell University, was one of the first to assume form as a technical institution. Its greatest initial difficulty was a lack of coordinated engineering information such as could be presented to students as a complete course. It was not for lack of such information but because it had not been collected in books. Much of the mathematics of today was undeveloped in its application of engineering. The calculus was yet only partly discovered and much of it was delivered in lectures.

With the development of engineering colleges under the Morrill Act, text-books soon took form and courses of study were formulated much as they are today. The rapid development of the steam engine and power industries soon made machinery so complicated as to demand mechanical engineers, whose special field was that of the industries. Then came the study of electricity which grew in a few years to such proportions as to require electrical engineers. The whole field of engineering tended toward technology, each branch dividing and subdividing until there are many special types of engineers in each branch of technical engineering. For example, telephone engineering is now a distinct branch of electrical construction.

While engineering education was in its formative period, agriculture had developed its use of machinery and the various engineering adaptations until it seemed to demand a new type of engineers in whom might be embodied a knowledge of engineering as it is related to agricultural operations. It is quite evident that long ago the farmer recognized the lack of engineering instruction in that type of education which he was at first in no position to satisfy. There being little disposition on the part of the technical engineers to furnish the desired aid, there came a time when it was proposed to create a new type of engineer. Heretofore the various forms of engineering had separated from the parent stalk because of the scope of the various field. Agricultural engineering, however, was an aggregation and included all forms of engineering that were related to that industry.

The development of tillage and harvesting machinery, the application of power in every form, the widely extended use of concrete, the possibility of reclaiming vast areas of swamp lands and the irrigation of arid regions; all these and more, seemed to demand an engineer who is at once an agriculturist with an intimate knowledge of crops and herds and a technical expert with perfect understanding of all things engineering.

The earlier attempts to formulate this separate technical agricultural engineering course were along the lines of combining all such subjects, drainage, irrigation, roadmaking, concrete construction, building construction, agricultural machinery, electric generation and distribution, etc. When made into a systematic course of study these include the essentials of agriculture, chemistry, civil engineering, mechanical engineering, electrical enginering and architecture. Agricultural engineering may include all of these and considerable more, but technical engineers are generally content to stick to one branch of work. Established engineering has never recognized agricultural engineering as a branch of the profession. The opportunity for employment to its graduates is confined to special work

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and to the teaching profession. Roadmaking still requires the professional services of a civil engineer and mechanical engineers continue to design and manufacture agricultural machinery.

Regardless of this condition there still remains the fact that at present those responsible for agricultural instruction are not satisfied with the available engineering instruction. It is evident that the farmer wishes to form a working acquaintance with all the machinery required in his business. He wants to know the most important facts and methods in concrete construction. He desires a knowledge of electricity that will permit him to decide as to its general application to understand the use of dynamos and motors. He needs to be acquainted with the essentials of water supply, sewage disposal, plumbing, heating and ordinary sanitation. He demands a fund of information that will supply a general working knowledge of these subjects, without the technical analysis that is required of engineering students; but, alas, as yet there are no text-books to supply the information in the form he desires.

Satisfactory texts dealing with growing industries are difficult to produce, but they are coming. The cement manufacturing companies are formulating much information in pamphlets that cannot for some time appear in book form. Electric manufacturing companies are printing the instructions that are required for the successful management of their apparatus, but the material is not yet sufficiently stable to risk its crystallization in printed books that may become out of date in a year or two.

We are today in much the same condition as were the pioneers of technical education. When texts are to be obtained which contain concise information, the teaching of subjects such as are required in agricultural courses will be simplified and, instead of attempting to become technical engineers in many fields, satisfactory courses will no doubt be presented in the essentials of each. Judicious selection among desired subjects will take the place of an attempt to absorb the entire field of engineering.

It is time that we were recognising the requirements of the various industries and shaping our courses of study to suit localities rather than to adopt standard curricula that are presented without regard to our locations in relation to the centers of industry. What more perfect union of agriculture and engineering could there be than that of flour milling? The mill manager must be acquainted with milling machinery, with motive power and its generation; he should know by analysis and not be required to guess at the quality and flour-making properties of wheat; and he must be familiar with the treatment necessary to combine all of these into a product that, when marketed, will make money for his company. Such a course might profitably comprehend a course of power generation in which steam engine and boiler trials and the economy of fuels, are made an important part. To this would be added studies of the steam turbine, hydraulic engines and electric generating machines and a course in power transmission to which would be added a study of the special machinery of flour mills; this for the engineering side of his training. Since his work has to do with the most important of farm products, his agricultural training would include, besides the customary botany, plant breeding, grain testing, grain grading and the bread producing properties of grains. These with the actual milling of breadstuffs would form a course in which agriculture provides an outlet for a course of technical engineering. Such

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courses are now being offered. The example is used here only to illustrate how technical engineering may be applied directly to agriculture.

Engineering as allied with agriculture may assume two forms; it may be either of a non-technical nature, intended to provide general engineering information in a course of agriculture or it may be a technical course, formed by adapting technical branches to established industries; that is to say the course may add a fund of general information to a technical course of agriculture or it may provide technical branches that may be applied in a business. The course of study that includes all branches of engineering can produce only a "Jack-of-all-trades," with its inevitable result.

THE CHAIRMAN. The committee to whom was referred the matter concerning engineering student exemption will now make its report.

G. W. BISSELL. The committee appointed to formulate the views of the division touching on the effect of draft on engineering students found that the same matter was under consideration by the Executive Committee, and that Dr. Capen, representing the Federal Bureau of Education, was also interested in it. The Executive Committee, Dr. Capen and your committee held a joint session this afternoon and, as a consequence, I am able to report that there are being considered by the Executive Committee certain propositions expressing views on three points, as follows:

First, that provision be made by proclamation of the President or otherwise, modifying or supplementing the regulations affecting the draft, so that engineering students of the fourth, third and second years in well recognized engineering colleges may be allowed to enlist in the Reserve Officers' Training Corps and be held upon waiting orders from the Adjutant General of the Army and not required to report at mobilization camps.

Second, that students in agricultural courses be considered by the War Department as coming under class 3 under the new regulations affecting the draft.

Third, that instructors in engineering and agriculture and other technical courses in colleges be considered as coming under class 4.

These matters are being considered by the Executive Committee. Your committee felt that it would be better to leave matters in this way rather than to suggest action by this division at this time, because whatever action we might take would have to pass through the hands of the Executive Committee anyway before it became the expressed will of the Association as such.

On motion, the action of the committee was approved.

The committee on nominations of officers for the coming year made its report, which was accepted, adopted and ordered referred to the general session for approval (page 172).*

On motion, the division adjourned *sine die*.

*The officers of the Land-Grant College Engineering Association are: W. M. Riggs of South Carolina, President; O. V. P. Stout of Nebraska and H. D. Boardman of Maine, Vice-Presidents; A. A. Potter of Kansas, Secretary-Treasurer; Executive Committee: the officers and R. L. Sackett of Pennsylvania, W. N. Gladson of Arkansas and G. A. Covell of Oregon.

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SECTION ON EXPERIMENT STATION WORK

Afternoon Session, Tuesday, November 14, 1917

The station section was called to order at 2 P. M. by the chairman, Director R. S. Shaw of the Michigan Agricultural College.

The Chairman. The Chair appoints as nominating committee Directors C. D. Woods of Maine, C. E. Thorne of Ohio and R. W. Thatcher of Minnesota.

The first paper, entitled "The Economic Use of Food Values," will be presented by Dr. Graham Lusk of the Cornell Medical School.

On motion, it was voted to ask of the Association that the article by Dr. Lusk be published as a separate. (See page 70.)

[Dr. Lusk's paper, being copyrighted, is not available for publication, either in the Proceedings or as a separate. The secretary of the section, Director W. M. Jardine of Kansas, regrets the misunderstanding.]

The Chairman. Doctor Raymond Pearl of the Maine Experiment Station will discuss the relationship of the experiment stations to food production and conservation.

What Can the Stations Most Profitably Do to Increase the Efficiency of Food Production and Conservation in the Present National Emergency?

By Raymond Pearl

I have chosen to discuss very briefly experiment station work in this war crisis, not merely in relation to the production and conservation of food, but in general from the standpoint of policy in relation to the whole matter of disarrangement of scientific work by the war.

I have felt very strongly ever since I entered upon experiment station work some ten years ago, that the function of the experiment station is, or should be, simply and solely scientific research on the basic problems of agriculture. That is its fundamental purpose and object, as I understand it, and I believe that the same general principle holds as true in time of war and during this present emergency as at any other time.

We must, however, recognize that a situation like the present one, where pretty nearly everything in the world is upside down, is an extraordinary one, and that it is difficult for many reasons to maintain, pure and unalloyed, the above mentioned basic principle relating to experiment station work. In the first place, stations have experienced a considerable loss in personnel, their men from department heads to the assistants having been called away, by the draft or otherwise, for war work of one sort or another. That, of course, injures continuity of the work. Then, furthermore, the general psychological restlessness which is induced by war conditions has made it very difficult for one to maintain that even temper of mind which goes with most successful research. When he notes each morning how far the Germans have driven into Italy, or what the Bolsheviki have done the previous day, it is not conducive to even thought, or even maintenance of station work at a normal level.

It would seem that a rather imperative duty rests on experiment station workers right now to take stock of what they are doing, to review the station's activities, to see just where they stand in relation to the

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fundamentals of station work and the upsetting effects of the war situation. It seems to me highly probable that the war will last a long time. The supposition, with which various belligerents and others have from time to time deluded themselves, that the war was shortly coming to an end, has failed to materialize. Station workers must needs look the probability squarely in its face and must realize that all the factors which tend toward the disarrangement of scientific work will grow more pronounced with the prolongation of the war. Hence it seems to me that the first duty is to make certain of the continuation of what we may call the fundamental and permanent station projects; projects on which much work has been done, and in regard to which the real effect on agricultural science in the long run depends on the continuation of the work—I refer to projects in which the permanent carrying on of the work over a long period of years is fundamental to success. The chief criticism of American experimentation from the scientific standpoint that has been made by European workers has been of its shiftiness, its inpermanence. Somebody will start a nutrition experiment, say, and it will progress famously for two or three years, and then, owing to some untoward circumstance, it will be discontinued before results of real permanent or fundamental value have been secured. Now this war situation greatly increases the danger of abortive effort, and everyone who is interested in the growth and development of our stations should guard against this danger.

The second point I would make is that all ephemeral demonstration work now being carried on by the stations which does not directly relate to war problems should be stopped. If a station is going to do any piece of ephemeral work, which makes no permanent contribution to the upbuilding of agriculture in a time like this, let it be directly related to war conditions or else let it die its death. Whatever residue of human energies and of station funds may be available, after the permanent, solid work, which is calculated to make a lasting contribution to agricultural science, has been provided for, should now be directed towards the solution of special war problems. There are many such. If any station is in doubt as to what and where they are, there are plenty of people here in Washington who would be delighted to introduce them to problems, concerning which those of us who are charged with one or another phase of direct war work want information and want it badly and quickly. It has always seemed to me that scientific research is amenable to a good many of the same sort of laws as are other kinds of activities. There are certain problems on which one can get the same results in either of two ways; either you can put one man on it and give him lots of time, or you can put 20 men on it and get the same results in something approaching one-twentieth of that time. I do not say that all scientific research work falls in such a category, but I am saying that certain problems do and that if you multiply the number of men you can get results on those problems in proportion to the number of men who go at it in cooperation. It is just along that line that we have tried, through the National Research Council, and especially its committee on agriculture, quickly to bring about certain desired results in connection with the agricultural war work. That committee is made up of station men and department men in equal numbers and a somewhat smaller number of independent scientific investigators, connected neither with the stations nor the Department. That committee, by meetings and correspondence, has agreed on a limited number of prob-

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lems, on which in this national emergency it is extremely desirable quickly to secure results. Through the committee we have arranged cooperation among a number of stations and the Department, with results which promise within a short time to yield desirable results. If there should be no concrete results whatsoever directly bearing upon war problems, I think the Agriculture Committee of the National Research Council would have more than justified itself in having brought about an active cooperation between the Department, the experiment stations, and outside workers, and in its development of a wholly different spirit among these interests than anything I have seen hitherto. I think the Agriculture Committee of the National Research Council will carry that work of cooperation much further, and that when peace comes again it will be possible to attain results in a broad way in American agricultural science that could not have been attained, at least not for a long time, by any other agency.

So much for the general side of the matter of the direct war work of the experiment stations. To turn to a more specific phase of the matter, namely, the relation of experiment stations to the food situation, as perhaps easily visualized through the Food Administration, it seems to me that the experiment stations of the country ought to be more reliable sources of information regarding the agricultural conditions in their own States than any other in existence. I started out on that assumption and endeavored to collect information that was not in existence elsewhere, and which it was important we should possess promptly. It was a surprise to me to discover that on the whole the experiment stations fell lamentably short of being acquainted with the agricultural conditions in their own States.

Now, as a suggestion for strictly emergency war work—not the sort of thing which I would for a moment urge that an experiment station do as a part of its permanent work, but as a thing that it might very helpfully do right now—a little census taking might be worth while, which would put the stations in the possession of at least some of the basic facts regarding the agriculture in their own States. I believe no station would find such information superfluous for its own direct purposes; on the contrary it would find it highly useful. If the stations would interest themselves in getting such information it would have an enhanced value, I believe, owing to the fact that we could depend on its being scientifically accurate.

Another line of work which the stations must take up shortly, along with all the other agencies, looks toward the stimulation of production. The task of feeding ourselves, our Allies, and various scattering countries of the world, which have for a long time depended upon the United States for a certain portion of their food, is a stupendous one, and one that is going to require every ounce of effort which can be put forth in this country by every available agency. I believe that the station's function in the campaign for the stimulation of production which is now beginning, and will continue with increasing volume, should be that of a critical guide. Having regard to the local conditions in each State the station director and staff should be in a position critically to advise and guide that stimulated production campaign, which will be directly operated by extension workers, better than any other agency. In other words, the stations should be the guides and critics charged with the duty of keeping their people from making mistakes in the hurry-up of production.

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The stations might well, as a war emergency measure, overhaul their published reports and bulletins from their beginning, and reissue in an abbreviated and digested form such information as would be likely to be of use in the present emergency. I am led to make the suggestion for the reason that as chairman of the Agriculture Committee of the National Research Council there have come to me from several station directors and workers suggestions of lines of effort that might be undertaken as war emergency measures, which I happen to know have already been undertaken by stations and carefully worked out from 10 to 25 years ago. The material is in existence but it has been forgotten in the fury of printing which has seized upon the American people. We get things out so fast today that we forget the things we printed day before yesterday. Everybody who has taken the trouble to study experiment station literature knows that it contains a vast mass of information, much of which if brought out now in brief form would be just what is needed in connection with many of these emergency war problems dealing with agriculture. Let me offer a specific example of that point which has come up in connection with the Food Administration. Some months ago the British Food Administration asked Mr. Hoover to place at once a force of trained investigators on the problem of whole wheat bread, made from flour of 100 percent extraction, as compared with straight flour bread of, say, 71 or 72 percent extraction. By experience in the war zone it has been found that ordinary wheat bread was better than whole wheat bread, but the English have had to meet a great publicity campaign, skillfully engineered by advocates of whole wheat bread, and they wanted scientific data to use in that campaign; and they wanted us to set somebody to work at the problem. Now the Maine and Minnesota Stations long ago carried on comprehensive experiments on this very matter and secured perfectly consistent and clean-cut results, the validity of which has never been questioned, and shorter trials have since been made in which essentially similar results have been secured. These results are buried in the early volumes of the reports of the Maine and of the Minnesota Stations. But they are matters which are of direct and immediate value today in connection with an emergency war problem. They are buried so deeply that almost everyone has forgotten about them, that is to say almost everyone who does not happen to have been working in the field of nutrition. One need not emphasize the fact that the circulation of experiment station reports and bulletins in European scientific libraries falls very short indeed of what it should be from the standpoint of the scientific investigator who wants to get his results in the hands of workers in the same fields. This concrete example is but an earnest of what I believe would result if all the stations should go through the files of their own publications and choose what portion, from their own point of view, looks as though it might be useful information to place before the people at this time.

To recapitulate, my first point is that as station workers we must face the situation that the war is likely to last for a long time, and should make our plans and shape our work accordingly. My second point is that if the war does last for a long time all activities, scientific and otherwise, will be measured in terms of their usefulness in relation to war. We may not like it, but that is what will happen. It is the duty of every experiment station director so to plan the work of his station as best to meet this test of emergency usefulness, and at the same time conserve those

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fundamental investigations in progress, on which all advance in agricultural knowledge is based.

THE CHAIRMAN. Director E. W. Allen, chief of the Office of Experiment Stations in the Federal Department of Agriculture, will continue the discussion.

WHAT CAN THE STATIONS MOST PROFITABLY DO TO INCREASE THE EFFICIENCY OF FOOD PRODUCTION AND CONSERVATION IN THE PRESENT NATIONAL EMERGENCY?

BY E. W. ALLEN

The question of what the experiment stations can and should do to help agriculture in a direct way at this time has been a prominent one in the past few months and has probably stirred every station worker. It is natural that every station and practically every individual worker in it should be actuated by a desire to help to take a real tangible part in the country's big job. Certainly it is no time for "business as usual." Our highest duty is to help win the war. The stations have so generally thrown themselves into the situation and often assumed such large functions of leadership and special service that suggestion is difficult without seeming to overlook the response already made. There seems, however, to be doubt in the minds of some individuals as to how far the condition warrants a departure from established ideals.

Those in position to know make no attempt to conceal the fact that the European food situation is serious. They evidently feel that it is a matter of grave concern and that this country will need to continue to feed the allies in large measure for another year at least. This will be a supreme test of American agriculture, working under unusual handicaps. It will make it necessary to redouble our efforts in food production and economy. The producing power of the man and of the acre will need to be increased by every feasible means, and this will call for stimulation and aid to producers large and small, and the application of the best knowledge, foresight and skill available.

Naturally, therefore, this involves the experiment stations and places a responsibility upon them which will be felt to be paramount. Evidently the stations must view the situation intelligently and sympathetically and bend their energies to relieve it in every reasonable way.

While the stations are primarily institutions for acquiring knowledge, and no one would desire to see them even temporarily abandon their character as original sources of tried and tested information, the emergency presents special reason for some degree of temporary adaptation and less rigid adherence to strict limitations and the pursuit of established projects than under normal conditions. The immediate needs and conditions are a sufficient argument for conforming the stations' activities in a way to best meet the requirements. The country will expect it. This may be done without abandoning the true character of these institutions.

One of the first measures, if this has not already been done, might well be the declaration of a policy which will make clear to all the workers that the emergency condition is to be recognized in the station's activity, that it may involve some changes and will need the support and cooperation of all. The station as an organization must be put on the alert and made fully alive to service which will count in the coming year's campaign. This

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will suggest conferences of the station council and more studied effort in bringing the station actively into the emergency campaign. In many places this step has been taken, informally at least, but in others the effort is not organized and a considerable part of the staff have been little affected by it. Possibly there has been some hesitation to modify established projects and the class of activity because of the federal source of a part of the station funds. If so, it may be said that the needs of the Nation in time of emergency are above ordinary considerations, and there seems no valid reason why rigid standards and established routine should stand in the way of temporary adaptation which will enable the stations to meet their highest usefulness. There can be little doubt that the fundamental questions connected with meeting the present demand on American agriculture furnish for the time being the special problems and the most natural line of activity of the American stations. Many of these are relatively elementary, and to a certain extent local, some of them verging on experimental demonstrations due to the present abnormal conditions.

In meeting the situation it is not necessary that the station workers should step out of their character as experts in agricultural science and its interpretation. They will usually be more useful in that capacity than if they attempted to take the place of extension workers. They need especially to adapt their attitude and their vision toward the work at hand, so that they will think and observe outside the field of investigation and be alert to realize the full measure of their opportunity. Experts in various branches of science and theory may need to consider even more than usual the practical conditions prevailing and the practical aspects of their work and results.

Manifestly the first obligation lies in the direction of making the information which the stations have in hand readily available to the farmers and their immediate advisers. Some of this is already published in technical form, a considerable amount is unpublished and some again has not been reduced to practical form because further results were awaited. The stations may wisely take account of stock to determine what they have in the way of unpublished data or unapplied results which are applicable now and may be employed in an advisory way. The amount is surprisingly large. If every station worker were encouraged to examine his technical studies and experiments with a view to deriving their practical results and working out their application in farm practice, the result would be many important additions. The present is a time for a great harvest of station results. It gives an unprecedented opportunity for putting these into practice, since the suggestions growing out of them meet with an unusual ready acceptation.

The first and most important duty of the stations, therefore, is to see to it that the information they have acquired, as far as it has a practical and present-time importance, is put into practice. This may frequently call for tests of these results which will make them applicable to these conditions.

In the second place it seems of the highest importance that very close and sympathetic relations should be maintained with the extension service. This has not prevailed uniformly in the past. The gap between the station and the extension organization has been too wide and the relations between the respective forces often have not been intimate. This does not make for efficiency. It weakens both services.

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It is the glory of the stations and the Department of Agriculture that they have in such large measure accumulated the information which is now forming the basis of emergency teaching. It is to their glory, too, that so much of it is known and effectively employed, for they have been large agencies in this dissemination. But the broad dissemination among the people now belongs primarily to the extension department, after the information has been set free.

On the other hand, it is incumbent upon the experiment stations, especially in time of crisis, to see to it that their results are adequately extended to the people. This does not mean that station men are to carry the results themselves in any regular way or serve as extension specialists, but it implies working in very close contact with extension agencies, interpreting the results of station work to them, maintaining a contact with the farming people through them, keeping advised of the special needs of the time and supplying the answer.

There is an interdependence between these two agencies. While separate in organization, they are not independent of each other but for the highest results at such a time as this they are mutually dependent upon one another. They can ill afford to work independently. Everything points to the necessity of concentrating our efforts. The two agencies need to advise and counsel together. The stations can guide and sustain this army of busy agents, answer the questions which come to them in their every-day experience and make their teaching doubly sure. Just as in normal times they are to replace tradition and opinion by reason, and uncertainty by hard facts, so now they will need to furnish much of the knowledge and procedure to guide the farmer and his advisers.

The stations' experts should also be in position to help in planning the extension campaigns and the programs for larger production. This is an unusual form of activity, but the times are unusual. Teachings and plans should be safe and sane and all the counsel possible is needed. The suggestions and advice to be offered to the farmers ought to be tested in the crucible of the stations' expert knowledge, and should be considered broadly as to their effect and in relation to the economic and other conditions of the time. The station should be at the council table when the agricultural needs are being considered and the plans and campaigns are being worked out. This has not always been the case.

Again, we can hardly avoid some revision of the station's program of work. This will be necessary to meet the special demands upon it, because of lack of funds and loss of men. Almost inevitably the stations will be placed more or less upon a war-time basis. Hence it may well be a time for a careful review of the station activities with a view to eliminating or postponing certain projects which are not pressing, bringing others to a point where they can be placed on the inactive list without detriment or giving them a more immediate practical trend, or, again, singling out such as from their nature are so timely that they should be pushed vigorously; in other words, directing the station's activity to live subjects. This has been done at some of the stations, with the result that their work has been reshaped to lay emphasis on emergency topics and allow more time for special expert service.

Such a course will require careful consideration of the nature and special requirements of established lines and projects. Violent and sweeping changes are not to be advised. No one would wish to see systems of

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plat experiments abandoned, or long-time breeding studies interrupted, or investigations disturbed for which special provision has been made in the form of herds, flocks, orchards or other living collections. But there are other lines where interruption would be less serious. Some things are more important now than others; some can be more easily deferred than others. Most of the stations have more lines than they can carry readily, so that some selection is necessary if added duties of a special nature are to be taken on.

The study of fundamentals for themselves which have no particular present application to agriculture may often give way to those likely to be of direct benefit. An examination of the existing program by a council of all the workers would enable a conservative revision under which special emphasis would be laid on timely projects and the practical aspects of others developed. Furthermore, in deciding upon new lines or projects, their suitability at this time evidently ought to receive special consideration.

Without attempting any extensive catalog of lines which seem especially profitable, a few suggestions may be ventured by way of illustration. In time of demand for maximum production and of shortage of usual supplies of feed, fertilizers, etc., the determination of the limiting factors of production and economy of supplies assumes unusual importance. Potash had been thought to be an important factor for certain crops and on certain types of soils, but three years have shown it to be less generally important than supposed, and that in some cases it is not limiting or serious factor. In other cases it is highly essential to yield and quality and in such cases the minimum requirement is an important point to determine. Nitrogen is the factor which limits production in other instances and hence the practical means of supplying it, making it readily available and conserving it are live questions.

Transportation companies experience enormous losses of food products, especially perishables, in transit. Some of them have attempted to enlist the aid of investigators to determine the causes and the conditions for avoiding them. This is a good war-time problem in food conservation. Representatives of cold storage plants report excessive losses of many food products in storage, especially eggs and poultry. The factors which contribute to or are responsible for this are not fully known. All will agree that they ought to be known at this time.

Greater economy in meat production through a larger use of those products which are not suited for human food seems an important present problem. It is a many-sided one, involving systems of farming and farm management. Evidently it is not one to be solved by desultory, haphazard work. It is too large a task for a single institution. It is especially a problem calling for organized effort on the part of a considerable number of institutions. The same need and opportunity are presented by the dairy industry, where the continuance of production of milk on an economical basis is recognized as of paramount importance.

In the midst of a shortage of needed fertilizers there is still an enormous waste of fertility in the improper handling of barnyard manure. This is said to be due to lack of heed rather than lack of information. But change has been effected in other lines far more radical than the proper saving and use of manure; and it is admitted, furthermore, that our knowledge regarding this material and its most economical handling and use to secure the largest effect still leaves a good deal to be desired.

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With the shortage of the usual supplies and necessity for economizing products which can be used for human food, a variety of new materials or substitutes are being suggested or placed on the market—new sources of feed only sparingly used heretofore, such as soy-bean products, peanut meal, velvet bean meal, sunflower silage, etc., and new forms of fertilizing materials such as soft phosphate, potash-carrying materials, etc. These will need to be given experimental trial before the stations can speak definitely as to their value and best use. There will also be the search for new sources, and this may likely need to be extended to products for human food. The soy bean, for example, has been quite widely recommended for human food, but there is little work on the place of its products for this purpose or the use of such material as soy-bean meal in bread making. The conservation of food is quite largely empirical. For example, the bacteriology of canning methods offers opportunity for thorough study, which should be highly profitable.

It would seem advisable also for the stations to extend their studies into various parts of the State where the problems lie. Already they are paying special attention to the appearance or outbreaks of insect pests and diseases and exercising unusual vigilance to reduce loss from this cause. The county agents can aid in this by keeping a watchful eye and directing the station's attention to places where its help is needed.

In its varied activities the unity and identity of the station organization ought to be preserved. It is a time for uniting forces, those within itself as well as outside, and for bringing the staff together for council meetings to consider and plan profitable lines of action.

Various plans are being made, to which Dr. Pearl has referred, for studies in which the stations will be asked to participate. It is hoped that provision may be made for this in the revision of the stations' programs, so that they may be in position to take part in some of these special studies. There would not seem to be reason for hesitating to undertake some lines of investigation which will require considerable time to complete. The time element is important in many of the measures, but unfortunately the outlook indicates that there will be ample time for investigation which can not be completed within the year. The main thing is that it should be upon live topics and aim at direct application. Moreover, the stations will need to look ahead, as well as to the immediate future, and anticipate as far as possible the aid that will be needed later, even after the war.

The occasion offers unusual opportunity for cooperation and coordination. No single station can hope to cover the whole field, hence there is need to economize the efforts of all by avoiding needless duplication and by working together on experiments where a variety of conditions and a considerable body of data are essential. One of the advantages of cooperative study is the avoidance of danger from generalizing too broadly from experiments at a single station. There is a natural tendency to view many of the questions which are studied and interpreted from a local or provincial standpoint. Cooperative experiments which give a broad test under a variety of well defined conditions enable the variables to be reduced and differences more readily traced out. Such experiments eliminate the individual bias, and minimize individualism and provincialism in their interpretation.

Finally, from their broad study of the entire situation, the stations

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may be in position to suggest plans and to anticipate needs which will arise, or to institute movements to meet conditions and minimize their effects. As experts and students, they may profitably take a far view and use their forces to help the country meet the unusual situation.

In my judgment, therefore, the experiment stations can be of the greatest service at this time by continuing to serve in the capacity of experts in agricultural science and its interpretation, by supplying tested and reliable information and making this available and applicable, by expert study of the general situation in its relation to agricultural production, by supplying counsel and formulating broad plans and policies, by being alert to detect and act upon the present necessities and by exercising foresight in preparing for post-bellum conditions. They can do this:

(1) By letting their work be known—by seeing to it that it is written up and published promptly.

(2) By maintaining unusually close relations with the publicity and teaching agencies, seconding the efforts of the extension and other forces in helping and protecting the producer.

(3) By a revision of their project programs, selecting for special attention those having an emergency or present importance and by adapting others so as to take account of the changed conditions resulting from the war.

(4) By working close to the ground, reaching out into the State and maintaining an unusually close contact with the actual conditions of production.

(5) By inaugurating, to a limited extent naturally, new investigations having war-time and post-bellum significance.

(6) By working close together, either in cooperation or with mutual understanding, and at least with full recognition of other similar work, in order that greater security may be attained and time economized.

E. A. Burnett. Do I understand that men engaged on technical projects whose salaries are paid from funds which are severely restricted, can be used under the present circumstances in part for general outside work, that such a procedure would be considered legitimate, that no question would be raised as to the strict usage of their time on station projects?

E. W. Allen. It would depend upon the character of their work. My feeling is that station men should confine themselves to their regular field and that in expository matters they should deal primarily with extension people who are in direct contact with the people.

The Chairman. What can you say as to project revision or adaptation in the present juncture? How far can an experiment station official go?

E. W. Allen. No sudden change should be permitted which will be likely to prove detrimental to well established work which has been in hand for a considerable length of time. Obviously, much research work is of a character which would suffer seriously if interfered with, particularly where facilities have been gathered which either must be maintained at considerable expense or be abandoned. However, it should be said that a careful revision of a station's lines of projects may result in the discovery of certain enterprises which have reached a point where either they may be partially reshaped so as to give them a somewhat more immediate prac-

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tical significance, or brought to a point where temporarily they can be laid aside without detriment, in which event others might be instituted which would possess a more immediate bearing at this time; all this without impairing the scientific character of the work. It is difficult to generalize on such a proposition.

I am impressed with the fact that some lines of station work are of more importance to present day agriculture than are others. A director, with the advice and counsel of his staff, may be able so to sift his projects as to afford relief and to enable the taking on of new and valuable lines.

Many station investigations have been under way for a long time which do not seem likely to furnish very definite results in the near future. These might be temporarily laid aside without serious detriment and perhaps without hurting the feelings of the investigator.

J. G. LIPMAN. I am sure that there is no unwillingness on the part of the stations to furnish information; but they are confronted by this serious difficulty, either that there is no information available to them, or else they are unable to induce the extension specialists or county agents to take time enough to study carefully and cautiously the station work that has been done and to advise the farmers accordingly. It is largely a question of time limitation with some of the agents and other specialists that are carrying heavy burdens.

Several New Jersey farmers have written me asking when the Government was going to import nitrate and when it would be available. I could give them no information. There was none to be had. They have written as to the distribution of certain seed. I am not able to give them that information. The stations are not in position to advise farmers as to what fertilizers will be available next spring, although farmers want such information. They cannot advise them as to the condition of the transportation facilities, a most important matter, or as to the output of agricultural implements, or when they may reasonably expect deliveries. The point I am trying to make is that our hands should be strengthened, that available information should be given us. Furthermore, attempts should be made to induce extension departments to place available information on a more exact basis, so that farmers may be more carefully advised. In the one case it is a question of lack of information; in the other it is a question of organization, of making information available in the different localities of the State.

We are asked to do our part in stimulating production. Now, we all understand that the volume of production can be stimulated by increasing either the acreage or the acre-yields. The acreage increment is to a large extent a question of labor, which it would perhaps be hardly worth while for me to discuss at this time. The acre-yield increment is not only to some extent a question of labor but also of supplies, as, for instance, adequate supplies of seed of a certain type, or of lime, barnyard manure, or fertilizers. And, of course, the question of profits enters. But labor is one of the large limiting factors in production. In the States in which acre-yields may be augmented by an increased use of lime or fertilizers, effort should be made to bring about this result because larger profits are likely to be secured without corresponding increases in labor.

The nominating committee made its report, which was accepted, adopted and referred to the general session for approval (see page 172).

On motion, the section adjourned *sine die*.

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SECTION ON EXTENSION WORK

AFTERNOON SESSION, TUESDAY, NOVEMBER 14, 1917.

The section was called to order at 2 P. M. by the chairman, Director R. K. Bliss of the Iowa State College.

THE CHAIRMAN. The Chair appoints as the committee on resolutions, Directors W. D. Hurd of Massachusetts, W. C. Lassiter of Arkansas and J. M. Jones of Virginia; on the committee on nominations, Directors M. S. McDowell of Pennsylvania, R. J. Baldwin of Michigan and J. A. Wilson of Oklahoma.

The success of the extension departments in carrying out the government program depends largely upon their ability to coordinate and unify the work of the various public and private patriotic organizations and individuals in their several States so that there will be no overlapping of effort. Your program committee felt that this matter of unification of activities and direction of energy along productive lines was well worth discussing this afternoon. President R. A. Pearson, whom the Iowa State College has temporarily loaned to the Federal Department of Agriculture to act as Assistant Secretary, will discuss the subject of "Cooperation of the Extension Service with State Councils of Defense and other Public and Private Organizations."

COOPERATION OF THE EXTENSION SERVICE WITH STATE COUNCILS OF DEFENSE AND OTHER PUBLIC AND PRIVATE ORGANIZATIONS

BY R. A. PEARSON

Most of us have experienced considerable difficulties arising when we have moved our headquarters from one place to another and changed the character of our work more or less in connection with the moving. We know something of the lost motion that occurs, the adjustments that have to be made. Now this Nation is going through such a change and upon a tremendous scale. It is, in a sense, moving the field of its operations, changing the character of its work. In the past its chief purpose was to promote the industries of peace, and now its chief purpose is to win the war. In connection with this change, its annual expenditures have suddenly jumped from something like $1,000,000,000 to about $15,000,000,000—a sum so large that no one can comprehend it.

I have only one main point that I propose to leave with you. It is that we should expect much readjustment, much lost motion, much revision and re-revision of methods of work before we attain the desired level of efficiency. This country is filled with patriotic people, willing and anxious to serve. The Secretary of Agriculture this morning referred to them in most complimentary terms. There are many men and women in Washington today and throughout the land who, forgetful of their private interests, are giving their full strength to the carrying on of the nation's job.

Under these circumstances we have developed in our States various new agencies, old ones have become reinvigorated, and here and there quite frequently we find that there are two or more good people or groups of people who are striving to do the same thing. Sometimes there is one who feels earnestly, probably due to his haste, that his way is the only possible way. He feels that so intensely and so exclusively that it is difficult if

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not impossible for him to see that at some other point there is another person trying to do the same kind of work that he would do. These difficulties occur in Washington as well as throughout the States. For example, there has been considerable uncertainty as to the scope of the Council of National Defense, with its many committees, taking up scores of subjects and frequently with great efficiency, much doubt as to the scope of the Food Administration and much doubt as to the scope of the Federal Department of Agriculture. In respect to the Department of Agriculture, which has been occupying its field for many years and whose work is well known to many people, the doubt was chiefly in the minds of those who, having come in from other kinds of activities, had not been in touch with its work. These uncertainties rapidly are being removed. However, new points are being constantly raised which present questions as to proper jurisdiction. The Secretary of Agriculture in his address this morning defined very clearly the main functions and duties of the chief branches of the Government in connection with the emergency work that you and I are trying to do as well as the regular work connected with our offices.

The state directors of extension and their associates should keep busy and accept this new situation good-naturedly, philosophically, and make the best of it. Many of them have succeeded admirably in handling very difficult and delicate situations. They have gone forward or, at least, should go forward with their work along the usual lines, handling interferences or difficulties as they arise tactfully, one by one, undismayed, not discouraged at apparent trespasses upon their fields. There should be in the extension office a list showing every organization in the State, which has or thinks that it has any responsibility or any special interest in working out our problems—the State College of Agriculture, the State Commissioner of Agriculture, the State Council of Defense, the score or more of men and women's organizations, public and private, that are striving to help or that ought to do so. A special study should be made of each one. The extension director should aim to discover what is the duty or the purpose of each one, what they are doing, should study their efficiencies, what they can best do. When he has made a complete inventory of that sort, covering all of these various organizations, he should then regard the whole list as a challenge, a challenge as to his ability and diplomacy. He should then tactfully use his best endeavors to draw the different agencies together, to direct their efforts along desirable lines, to secure the largest result in each community, in short to coordinate their work, giving little thought to whose name appears in the newspaper, but much consideration to securing results.

Much of the trouble, friction, heart burnings which have arisen, have been due to the fact that we have not properly understood each other. I believe that the suggestion, if adopted, should tend largely to overcome many difficulties.

The Government has definite aims in connection with this great campaign. The extension people are being informed as to these aims and purposes, as rapidly as possible. Last fall, after a careful study here and widespread consultation throughout the states, a wheat and rye program was launched. When the wheat has been planted and its area known, as soon as information is available as to the winter conditions, and as soon as the extent and quality of the corn and potato crops are known, then we will be in a position to formulate a program for next year's crop pro-

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duction, and further advice and help will be sought in that connection, which will be necessary if the program is to succeed.

In some instances troubles will arise that cannot be smoothed out by diplomacy and tact. These should be referred of course in carefully prepared statements to the "man higher up." We are proving many things in this war time; among others that we can get along with ourselves. It is a matter of great gratification that so few serious difficulties have arisen in this tremendous readjustment in the field in which you are concerned so vitally. We want here in Washington—and I am speaking for the moment as a government employee—to know about those rare cases that need adjustment. We are usually in a position to give assistance if the matter is properly and clearly presented to us.

We know no such word as "failure" in connection with the great campaign that we are waging, and which you particularly are waging because you are right out on the firing line. Here and there the winds may blow the seed out its ground and disease may decimate our flocks and herds; but who is going to be downcast or discouraged by mishaps or difficulties? We will work the harder to overcome them so that we may be sure that we are doing our share in large measure toward winning the war.

THE CHAIRMAN. Every extension department in the land desires to carry forward the government program. We have asked Dr. A. C. True, Director of the States Relations Service to discuss "The Federal Program for Extension Work During the War Period," with special reference to the expenditure of emergency federal funds.

THE FEDERAL PROGRAM FOR EXTENSION WORK DURING THE WAR PERIOD

BY A. C. TRUE

In the war emergencies relating to food production and conservation the nation-wide system of extension work in agriculture and home economics, organized and conducted cooperatively by the State Agricultural Colleges and the United States Department of Agriculture, has received broad and gratifying public recognition as an effective agency for the dissemination of practical information and instruction to great masses of the American people. Congress responded to the call for the expansion of this system in the passage of the Food Production Act of August, 1917, in which $4,348,400 was appropriated for the immediate enlargement of this cooperative organization among the rural people and its extension to the urban communities. In addition, several bureaus of the Department of Agriculture were given large sums to be spent in extension activities, which under the general "memorandum of understanding" between the Secretary of Agriculture and the State Agricultural Colleges necessarily come within the province of the same organization.

The Secretary of Agriculture allotted the $4,348,400 to the States Relations Service with instructions to enter into project agreements with the State Colleges to expend this fund on the three lines of work for which it was understood that Congress has made this appropriation, namely, (1) county agent work, (2) home demonstration work and (3) boys' and girls' club work. The subject-matter and methods of this war-emergency work, as defined in the Act, are "increasing food production and eliminating waste and promoting conservation of food by educational and demonstrational methods."

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The Bureau of Animal Industry has funds for cooperative extension work through several divisions. The Animal Husbandry Division, cooperating with the Bureau of Markets, will keep in close touch with the livestock situation throughout the country and will join with the state extension forces in promoting the movement of stock from one State to another whenever conditions make this desirable. Considerable sums will be spent in encouraging increase of poultry flocks and egg production. The Veterinary Division has funds with which agents can be located in the States to do extension work on animal diseases and more particularly on hog cholera. The Dairy Division is working on the stimulation of the production and use of soft cheeses and on the utilization of creamery factory by-products.

The Bureau of Plant Industry is prepared to make cooperative arrangements relating to the control of cereal diseases, particularly those of wheat, oats, barley and rye, and also of diseases of potatoes, beans and certain truck crops. There are emergency funds for work on sweet potatoes and peanuts, on problems relating to Irish potatoes for planting, and on the canning, drying and evaporating of vegetables and fruits.

The Bureau of Entomology is making cooperative arrangements with special reference to meeting emergencies regarding insect pests in the different States.

Other bureaus are engaged in extension work in various ways and there is a large amount of emergency publication work, the results of which are available to the state extension forces.

Even before the United States entered the war it was seen that the world's need for certain kinds of food produced in this country would be very large. Therefore, in planning the work for 1917 the extension forces had given much attention to increased food production and conservation. After the proclamation of war and during the prolonged discussion of the food production bill and related measures in Congress the Agricultural Colleges and the Department, joining hands with National and State Councils of Defense and other organizations, actively undertook campaigns along emergency lines, using for this purpose the extension funds already available, the additional Smith-Lever funds for the current fiscal year and such extra state and county contributions as they could command. A very large amount of useful work was done in this way and the embarrassment caused by the delay in the passage of the Food Production Act was in considerable measure alleviated.

The war emergencies relating to our food supply and its use brought so many problems to the federal authorities that they felt in increasing measure the importance of having in the States and counties representatives who could quickly collect and give information to meet new and rapidly changing conditions. From the federal standpoint, therefore, it is very important that the work of organizing the counties for demonstration and extension work should be pressed with the utmost possible energy. The difficulties of doing this work in the best way are greatly appreciated. The need of active cooperation of the local people, the limited supply of available workers with the desired training and experience, the complicated problems of supervision and relationships make the task unusually perplexing and burdensome. It is, however, so important to have as many counties as possible represented in this extension system at this time that no effort should be spared to solve the problems of organization. Good standards of work and personnel should be maintained as far as possible,

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but practical rather than theoretical ends should be held steadily in mind. A relatively narrow program which can be reasonably well carried out by agents of comparatively limited training in some cases may be better than not to have any work undertaken.

The patriotic motive must be utilized as far as possible and this should bring, and has undoubtedly brought, into our service persons who have to make substantial sacrifice of ease or money to engage in this work for the public good. At the present time about 1,700 counties are organized, leaving about 1,200 counties without local agents. A considerable number of these counties have, to a certain extent, the services of district or state workers. The number of agents and assistant agents, including negroes, is about 1,800. Adding the state and district agents there are about 2,200 persons connected with the county agent work. It is, however, evident that the task of thoroughly organizing the country for this very important service is by no means yet completed and that we cannot afford to relax our efforts in this direction.

Food conservation and household thrift are such important matters at this time that the extension work among the women should be expanded with fully as much vigor and speed as the work among the men. This work can only be done most efficiently by agents permanently located in the communities for which they are working. It is, therefore, essential that home demonstration agents be established in as many counties and cities as possible. This work has been pushed with gratifying rapidity. There are now 1,120 women agents in 1,300 counties and cities. The increase in this work has been relatively great in the Northern and Western States where 320 agents are now at work as compared with 24 on July 1, 1917. In the Southern States the number has been increased from 510 to 800. Adding the state and district agents there are now about 1,300 home demonstration agents at work in the United States.

The Food Production Act provides for the employment of home demonstration agents in the cities as well as in the rural communities. The immediate importance of such agents is great. Not only can they give much practical instruction to the women with whom they come into personal contact and disseminate much useful information through demonstrations, addresses, the public press and special publications, but, what is fully as important, they can greatly help to coordinate the work of the large variety of public and private agencies, which for the most part on a voluntary basis are attempting to do their part in showing the masses of women how most wisely to conserve and utilize their resources in feeding our great urban populations. The number of our cooperative agents in the cities at the best will be so relatively small that it will be necessary to give great attention to planning and supervising their work in order that they may have good opportunities to do their best work and a fair chance of accomplishing the most good.

Broadly speaking, this city branch of our extension work may easily become the forerunner of a permanent organization which will bring city and country people much closer together and help to solve some of the knotty problems of the mutual interests of the producers and consumers of agricultural products. Therefore, while we should be extremely busy in our efforts to do our part of the war emergency work in the cities, we ought not to lose sight of the opportunity this gives us of making the city people our permanent allies and comrades in practical extension work.

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In our special efforts at this time we must not forget the young people. We greatly need their enthusiasm and their faith that the world can be made better. They will take up with new ideas more easily than their elders and it will be difficult for even the most conservative communities altogether to escape the propelling force of the youngsters if they are well organized and instructed. The club work among the boys and girls should therefore receive very careful attention. Already a much greater number of young people have been drawn into this movement and have accomplished much during the past season. Probably nearly a million of boys and girls have taken some part in the club activities this year. But there are still nine or ten millions of youth between the ages of 10 to 21 who have not been touched by this work.

Then there are the extension specialists in the several branches of agriculture and home economics, whose headquarters are chiefly at the Agricultural Colleges. While the emergency funds directly in control of the States Relations Service are not intended to include the activities of the subject-matter specialists, special provision has been made for their work in the emergency funds of the different bureaus of the Department and in the increased Smith-Lever funds and special state funds allotted to them. Their number has therefore been materially increased during the past six months. It is estimated that about 1,900 extension specialists of the colleges and the Department are now at work in the States. They can be and already have been of very great assistance to the county and city agents in the conduct of special emergency campaigns, in furnishing up-to-date information through publications and otherwise and in solving difficult problems which the local agents are constantly encountering. The more closely they work with the county and city agents the better will be the results.

In the aggregate the cooperative extension forces now number about 5,000. If they really can be in effect the generals and colonels under whose expert guidance a great host of volunteer workers with their captains and other leaders are well organized and efficiently working, it will be difficult to set a limit to the good which will be accomplished.

In general the aim and effort of the Department has been to expand the cooperative extension organization already established in every State. The same policy regarding relationships has been maintained. The extension organization within each State is regarded as a unit under the administration of the extension director as the joint representative of the Agricultural College and the Department. Larger amounts of departmental funds are being used. It is so desirable to have the extension system in every county that we are not waiting to secure state and county funds to offset federal funds in every case. But it is our desire that every reasonable effort shall be made to secure such cooperative funds and such efforts should not be relaxed where the work is begun without them.

Broader cooperative relations with State Departments of Agriculture and Education, as well as with the new emergency organizations such as the Councils of Defense and the Food Administration, are being favored as in the interests of national welfare, especially in a time like this. The great need of prompt action under existing conditions makes it highly desirable that proposals for cooperation from various sources shall be acted on without delay. And this should be done within the Department as well as within the state organizations.

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The multiplicity of calls for service which are coming to the extension forces makes it all the more necessary that a definite program of activities be formulated and adhered to as far as possible. It is evident that for the present the emphasis should be laid chiefly on food production and conservation, though such things as cotton and wool production ought not to be neglected.

The extension program of the Agricultural Colleges and the Department may well include the following items:

1. *Full maintenance of the food supply.*

(a) By increased production of cereals, especially wheat and rye.

(b) By increased production of meat and milk, especially by full utilization of forage crops and roughages supplemented by carefully considered amounts of grain.

(c) By maintaining the production of potatoes, rice and beans to be utilized in replacing wheat and meat to a certain extent in the American diet.

(d) By the promotion of home gardening to supply family needs.

(e) By the production of perishable crops outside of gardens for home use only to the extent warranted by visible, established markets and transportation facilities.

2. *Conservation of the food supply.*

(a) By prevention of waste in harvesting, storing and handling crops on farms.

(b) By canning, preserving, drying, brining and otherwise conserving fruits and vegetables for future use.

(c) By advocating economy in the use of food, proper diets, prevention of waste and the use of such substitutes or new foods as may be necessary under a broad national program.

3. *Preservation of agriculture.*

(a) By careful attention in all communities to the selection and proper preservation of planting seed of all farm crops.

(b) By strongly urging the preservation of breeding stock of all farm animals.

(c) By strongly resisting all tendencies to overthrow or disturb the well established system of farming founded on the rotation of crops and the production of livestock, as well as cash crops.

(d) By advocating a well balanced system of agriculture in all sections. In cotton, tobacco and other one-crop sections a system of safe farming should be advocated which will maintain the production of the main cash crop and at the same time secure the necessary home supplies of food and forage and assist in maintaining soil fertility.

4. *Assistance in the solution of farm problems.*

(a) By aiding farmers to obtain needed farm labor.

(b) By aiding the development of the most economic methods of storing, handling and marketing agricultural products.

(c) By stimulating efficient business organizations of farmers.

5. *Assisting the Federal Government in the conduct of the war.*

(a) By gathering and disseminating information needed by the Federal Government in the conduct of the war program as requested from time to time.

(b) By cooperating with other federal and state activities in carrying out war-time programs of work.

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(c) By rendering other special and extraordinary service.

Among the farm women efforts should not be relaxed to relieve them from undue burdens by more economical and efficient organization of labor and equipment and by helping them to get more satisfactory sources of personal income.

In both country and city the women should be encouraged in their efforts to conserve food and at the same time to maintain a more hygienic nourishment of their families.

In these war times, national aims and requirements are necessarily more prominent. The Nation, States and local communities are brought close together in many ways. Old relationships are strengthened and assume new phases. The effect of these things will undoubtedly remain. It is, therefore, the more important that with broad sympathy and understanding our cooperation shall rest on a firm basis of mutuality of purpose, desire and object.

Thus in harmony with the spirit of our day we shall make a contribution toward the establishment of a broader democracy in which the best aspirations of the masses of the people shall be worked out in practical life with the aid of intelligent, well-trained and unselfish leaders, who are clearly recognized to be in closest touch and sympathy with the people in whose interests they are working.

On motion, Doctor True was requested to have his address mimeographed and promptly sent to the extension directors.

THE CHAIRMAN. Doctor True has placed special emphasis on the need of promptly organizing farm bureau associations in our counties. The program committee, anticipating such recommendation, selected two men, one from the East and one from the Far West, to discuss the question of organization required in the county before funds are available for the employment of emergency food agents. The chair takes pleasure in introducing Director M. C. Burritt of the College of Agriculture of Cornell University.

WHAT ORGANIZATION SHOULD PRECEDE FOOD EMERGENCY AGENTS IN A COUNTY?

BY M. C. BURRITT

1. OUTLINE OF THE SUBJECT

In the discussion of this subject, I shall assume what is implied in the title that some organization should always precede the placing of a food emergency agent in the county. I shall assume also that the nearest possible approximation of the organization used in ordinary times should be used in emergency work. The war in fact is the only reason for making any exception to the general rule. We face the necessity of subordinating everything else to the winning of the war. Organization, especially permanent organization, requires time. In the present emergency there is need for immediate action. Hence the need for a hastily constructed and perhaps temporary emergency organization. In all cases where possible, however, this should be so constructed that it can gradually be made over into the form of permanent organization. It is gratifying to note from correspondence with many extension directors that most States are putting in permanent organizations even in the midst of the emergency.

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2. Why any Organization?

Although I am assuming that we all agree that some organization is necessary, it is desirable that we first consider why organization is necessary, as this in large measure determines its character. Organization is necessary for the following reasons:

(a) It multiplies effort—especially self-help effort.
(b) It establishes close contact with localities.
(c) It makes leadership most effective.
(d) It provides a clearing house.

(a) *It multiplies effort—especially self-help effort.* Organization means the enlistment of others in the effort and not only increases the number working but applies the principle of self-help, thereby securing larger support, greater efficiency and larger results. The effort "stands on its own feet," tends to be self-sustaining and for this reason is fundamentally sound.

I must digress here to call attention to what seems to me a grave danger to this essential principle of self-help in this time of war-emergency work. Self-help is rare enough in normal times. It is so much easier for the leader to do the thing himself than it is to get others to do it, that, especially in times of great state and federal governmental activity, the already strong tendency of the Government to try to do too much for farmers is increased. It is so easy to forget and ignore the fundamental principle that government itself can never solve rural problems. Rural people must, in the main, solve their own problems. In times of war as in times of peace, we are in grave danger of defeating our own ends and of creating a rural peasantry, in attempting to do too much for farmers. It requires no stretch of the imagination to picture a farming population dependent, or largely so, on outside advice and information, which has lost its initiative, its traditional independence of thought and action, and has become dependent on the Government to supply not only the facts and the plan of work but also to initiate the action. This danger long feared in extension work is likely to be greatly multiplied in this war-emergency work.

This ought not to be so, even from the war point of view. Every citizen is now being asked to "do his bit." Our emergency extension work and organization offers the opportunity to utilize individual desire and willingness to work in an organized team. This opportunity should not be neglected.

(b) *Organization establishes close contact with localities.* The most effective work can never be done by an overhead, far-away agency. The organization ought to reach into every rural community. The community representatives should be in the closest possible touch with the local people and the local conditions. They will pass the local problems and the local point of view on to the representatives of the larger units. In no other way can the State or Federal Governments as rapidly and as effectively secure contact with the localities, their problems and the local forces for their solution. In good organization, each county agent has the best possible means of obtaining the confidence and respect of individuals in the various communities, a prerequisite of large results.

(c) *Organization makes leadership most effective.* Organization and leadership are two equally essential forces. Organization without leader-

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ship is practically useless and certainly ineffective. Leadership yields maximum results only when it is applied to well organized units. The local unit should have vigorous leadership, through which it may work. The county unit, the state unit and the national unit well organized make trained and efficient leadership of maximum value.

(d) *Organization provides a clearing house.* In this manner local needs may be expressed, plans best worked out and state and federal government programs quickly and generally put into active operation. The failure of a number of governmental programs can be directly traced to the lack of a sufficiently comprehensive and efficient organization to bring the program before and to interest a large enough number of individuals in it and then to put the program into operation. An organization extending into every rural community in a State is absolutely essential to the efficient carrying out of any state program. There must be a clearing house.

3. The Problem

In order to be efficient, organization must be adaptable and fitted to local conditions. The underlying principles of rural organization are everywhere the same. The methods by which these principles are applied vary with the State, the county and the specific local situation. In particular, before an organization is applied to any unit, we should know:

(a) The character, size and extent of the job.

(b) The time available in which to get the organization working.

(a) *The job.* The county unit usually varies in size from 2,000 to 10,000 farms. The number of townships in the county unit, the number of communities per township and per county, the established farm systems, rotations, practices, customs and methods all enter into the organization of a county unit and into that of the community unit as well.

Before the character of the job can be fully appreciated, the organizer should know who are the natural leaders in present lines of effort in the community—the men of best experience, their particular local connections and prejudices—in other words, who are the best men to tie to. A survey of the field should always precede any organization. Organization without a survey is likely to ignore important local facilities, to get tied up with the wrong leadership and to make innumerable mistakes. It should seek to discover:

(1) The local organizations that already exist—granges, societies, clubs, associations, etc. and their officers.

(2) The present leaders and men of influence—farmers, teachers, school superintendents, pastors, tradesmen, merchants, supervisors and even political leaders.

(3) The persons who are interested in this particular kind of work.

(4) Who are the best farmers—the ones whose word and influence command attention and a following.

(5) The best means of getting groups together—times, places, etc.

(6) What particular facts or situations may prejudice the work.

In some instances leaders have to be trained for their work, but in many other cases men naturally adapted to the job may be found. These should always be sought out, as they are likely to be efficient from the beginning and speedier results can be secured. It is also essential that the organizer secure the confidence in the first place of the leaders and then of the whole public. With this confidence maintained and the work satisfac-

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torily developed, respect will follow. The acceptance of the leadership is then assured. The real job is to bring about such an organization of the unit that real, helpful, appropriate information and leadership may be interpreted into immediate action and results.

(b) *The time available in which to get the organization working.* The word "emergency" implies haste. The need of haste is further emphasized by the great importance of food in this world-war and the comparatively short period of time which is available in which to influence food production and to bring about an increase.

It is absolutely essential then that the desired action be secured quickly. The agent must get to work at an early and an appropriate time and under circumstances in which results can be secured. Therefore, the time between the inauguration of the work and the planting of crops is an important factor. If the work can be inaugurated early in the winter, the field can be more carefully prepared, the organization completed to the last detail and everything prepared for speedy action in the planting and growing season.

The practical application is the actual selection of an executive committee, and, later, the selection of local advisory community committees or representatives. Upon the selection of the right kind of leadership and the organization of it into effective working units, the success of the whole work depends.

4. Essentials which the Organization Should Possess

As already stated, while there may be great variation in the particular methods by which any organization is put into operation, the underlying principles are everywhere the same. Some of these essential principles are:

(a) Local participation in the financial support of the work.

(b) Actual and definite local responsibility.

(c) Comprehensiveness or completeness with which the entire unit is reached.

(d) Leadership chosen on the basis of qualifications.

(a) *Local financial support.* In principle, it is essential that the county should contribute financially toward the support of a food emergency agent. Preferably this support should be both through taxes and through local membership—through taxes so as to place a part of the financial support of the work on the whole people, all of whom are indirectly at least benefited, and through membership in order to enlist the support and cooperation of those individuals who are specially interested in the work. This is the only way in which a county can really share in the enterprise.

Since administration follows funds, funds imply a real partnership. The psychology of this financial partnership is that the community and the individuals making up the community feel that it is to this extent their piece of work, their responsibility and their obligation to carry out successfully. This is the first essential of successful organization. A second and equally important one is wise leadership and direction.

The degree and the extent of local financial cooperation is not nearly so important as the principle, and it depends on local conditions. In general the locality should contribute at least one-half of the expense, where this is possible. It is pleasing to note and augurs well for the future of the work that this principle is accepted by the great majority of the

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States. The exact amounts vary in different States, but the localities are nearly always required to participate and in increasing amounts.

In practice with the regular county agents and in the fully organized farm bureaus, the counties usually contribute from three to four-fifths of the total cost, or from $3,000 to $5,000 against the public contribution of from $1,200 to $1,800. In the case of the emergency food agents, the counties usually contribute from one-fourth to one-third of the support of the agent, usually in the form of office rent, conveyance about the county, stenographic service, supplies, etc., but frequently also cash, while the college contributes salary and part of the expenses. Approximately the same has been true of the emergency home demonstration agents, except that the counties often contribute in addition to the above items, $300-$500 cash toward the expenses of travel.

(b) *Actual and definite local responsibility.* The responsibility for local facilities, finances, policies of work, etc., must be real in order to be really effective. This responsibility can only be of most value when it reaches to every man of the committee and to every member. This, of course, is difficult to attain. In most cases it has to be approximated. Frequently, unless great care is exercised, there will be only the shell or the name of an organization. One or two men will carry all the responsibility and they have to be constantly prodded in order to get the work done. This is likely to be as much due to the organizer as it is to the local people—contrary to the commonly accepted opinion.

The three main causes for the failure of a community to take responsibility are:

(1) Lack of understanding of the nature of the work and of the organization.

(2) Too much help with a consequent lack of opportunity to assume responsibility.

(3) Lack of real vital interest in the work.

The first and the second of these causes are likely to be the fault of the organizer and the third may be. The lack of understanding on the part of those who actually attend the organization meeting and even of those who simply read about it in the papers is usually directly traceable to the person presenting the plan and the work. If he is to explain it so that others can understand it, he must first have and then clearly present definite ideas himself. Organization and the individuals in it cannot really assume their part of the responsibility unless they are allowed to do so. There is too much tendency on the part of organizers to fear that this or that man will not do his work well and, therefore, to do it themselves. Men learn to do by doing rather than by having done for them. This is a frequent and usually a fatal mistake in organization work.

(c) *Comprehensiveness or completeness with which the entire unit is reached.* Ideally the organization should reach every community in order to provide it with the advantage of the leadership of the emergency agent and the means of helping it to solve its own problems.

In the regular work, I believe it is desirable, if not essential, that the whole county be mapped and charted and that every community in the county be organized with three to five representative farmers as committee members. Meetings of these committees should be called at once and community meetings arranged. At both these meetings the organization should be explained, the needs of the community brought out by questions and

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discussions, the means of work laid out by the committee members and a definite community program developed.

The carrying out of this plan depends almost wholly on the committee, but it is the obligation of the organizer to see that the community is at least mapped and charted, a committee selected, and a plan of work laid out by the group.

In the emergency work it is not always possible to take the time to develop this plan, which in the ordinary county takes from two to three months. It may be necessary to select the leading and most accessible communities in the county first. With these it is easier to do the most work and get the largest results in a short time, and this, of course, is what the term "emergency" implies. The work is then extended to other and outlying communities as rapidly as possible.

(d) *Leadership chosen on the basis of qualifications.* I have already indicated the vital importance of strong and wise leadership in the success of any organization. No matter how perfect the organization, leadership is half the battle.

5. An Efficient Organization

The securing, developing and using of the machinery created to do a piece of work so as to develop an efficient organization depends primarily upon three factors:

(a) A definite plan of procedure, its clear presentation to the group.

(b) A community program based upon a survey of problems and needs.

(c) Frequent meetings and consultations with officers and committees of the organization.

(a) *A definite plan of procedure.* Perhaps I can best illustrate what I mean by this heading by giving an example of the plan used in putting in an emergency or a permanent organization for a farm bureau. If there is plenty of time and the organization is to be permanent, the plan is developed in more detail.

(1) A preliminary meeting of all those interested in the starting of a farm bureau in a county is suggested. This group is gathered by the personal work of a few persons with whom the organizer gets in contact and by newspaper notices.

(2) The organizer (the state leader or one of his assistants) then explains the general plan of the organization of a farm bureau with carefully worked-out charts. The plan is discussed and questions answered so that each one present understands just what is contemplated, as fully as possible.

(3) A temporary chairman and secretary of this group is suggested. The group then enlarges itself to include at least one farmer in every township in the county, and if possible, in every community.

(4) Regular stationery, headed "Farm Bureau Committee" with the names and the committees for each township or community printed on it, is then printed. This is good advertising and commits all the men who permit their names to go on the stationery to the movement. These letterheads are used in addressing letters to the farmers of the county.

(5) A series of publicity articles, somewhat as follows, is then prepared and published in all the papers of the county.

a. Brief history of farm bureau movement.

b. How a farm bureau is organized.

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c. Purposes and work of a farm bureau adapted to immediate and emergency needs.

d. Some practical results where already organized.

(6) A meeting for the perfection of the permanent or temporary organization held about a month after this preliminary meeting is then advertised, the date for this meeting having been agreed upon at the original meeting.

(7) At this organization meeting three things are essential:

a. The clearest possible explanation of the plan of organization and purposes of the work, by means of charts, usually given by the state leader.

b. A well known speaker on some popular subject related to the work, to help draw a crowd and to get as many men as possible interested.

c. Actual organization carried on wholly by the temporary committee, so that both this committee and all taking part in the organization are absolutely committed to the idea, the organization and the work.

It is usually suggested that a nominating committee be made up of one person from each township in the county, this person to be selected by those present from that township. This general committee then nominates officers. The state leader keeps in the background throughout this organization meeting, making suggestions where needed and answering questions.

(8) This new executive committee should be met by the state leader immediately following the organization meeting. A suggested meeting of the executive committee about a week later should be immediately planned for. A definite program should be made out for this meeting, including the making up of a budget and a thorough-going canvass of the county for membership, if this has not already been done, consideration of candidates for position of agent, arranging for office and other details.

(9) Community committees and programs worked out along the same lines.

If some such plan as this is followed out, there will be no question about the support of the emergency agent or the regular county agent, in the majority of cases. Where conditions are favorable, it is possible to start and complete this entire plan, secure at least 20 percent of the farmers of the county as members and get the agent at work within 60 days.

(b) *A community program.* A great deal of this work fails because no definite and specific program is developed. Organization for organization's sake has little value. An organization should not be formed unless there is something very definite for it to do. If the plan previously outlined is carried out, it should be vigorously followed up and developed into a program and the organization put at work upon specific things in each community in the county before the enthusiasm wanes or the idea gets cold.

In securing such a program, a frequent mistake made by the organizer is that of making or seeming to make a program himself. There is nearly always a tendency on the part of the college representative to impress his ideas and programs upon the community. It is vitally important that the committee be given suggestions as to its program, but from the standpoint of getting the program adopted and making it an essential part of the community's life and work, it is absolutely necessary that the community make the plan itself. The experienced organizer will suggest to the community, by means of a chart or in another form, what some of their problems may be and put himself in the position of answering questions or

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making suggestions regarding plans to solve these problems. The chances of the organizer's suggestions, made in this way, becoming a part of the community's plans are increased rather than diminished by this plan and the program is likely to be vitalized.

Not only is this plan better from a psychological viewpoint, but it is likely to be better because of the bringing of local experience and ideas into it. It is in effect a preliminary survey by means of a suggestive outline of local problems and needs. The community is more likely to know what its real problems and needs are than is the organizer, but he can give breadth of view and completeness through wise suggestions.

(c) *Frequent meetings and consultation with officers.* Once the organization is secured, it must be used constantly. Just as more plows rust out than wear out, so more organizations die of dry rot and inactivity than because they are overworked. No mistake is more frequently made than that of going ahead and doing things for an organization which it ought to do for itself. Just as a child must have action and direction of its activity, so a young and newly formed organization must have actual and vital work to do under good leadership and it must do this work itself if it is to grow and become strong. The job of the organizer is to see that a program is developed, based on real and vital needs and then that this program is put into operation, but he should not try to do this himself.

SUMMARY

Organization for organization's sake is fore-doomed to failure. Neither can organization superimposed from without and which is not a vital part of the community succeed. But organization for a purpose with a definite, clearly set forth program is a necessary means of solving rural problems.

THE CHAIRMAN. This discussion will be continued by Director John T. Caine, III, of the Agricultural College of Utah.

ORGANIZATION REQUIRED IN A COUNTY BEFORE FUNDS ARE AVAILABLE FOR THE EMPLOYMENT OF EMERGENCY FOOD AGENTS

BY J. T. CAINE, III

Organization to establish close contact between localities and to multiply effort is greatly needed in all extension work. In no case is this more necessary than in the county agent type of extension. In the West especially, this problem of bringing the widely separated communities into close working contact is a vital one.

It is granted by all that a food agent or county agent should have some organization with which to work. You might just as well put a captain in the field without officers or enlisted men as to turn a lonesome food agent loose in a county. Of course, a good captain would soon recruit a company, and so a good agent may work out an organization, but it will mean a large amount of wasted time, lost efficiency and slow growth.

Counties as regards organization fall into two groups: first, counties in which there is no organization that can be used by the extension division; second, counties having organizations such as granges, farmers' equities, etc. It is with the first of these that we have had the most experience in the West.

Most of the States are agreed that the farm bureau is the type of or-

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ganization toward which they should work. For the safety and continued success of the farm bureaus we feel that they should always have a county agent or food agent to work with them. With this idea in mind, it is doubtful if the organization formed in the county before the man is appointed should be called a farm bureau. It might be better to form the temporary organization as a food production and conservation bureau or league. If this is done it will not react against the bureaus, if, perchance, the agent is not appointed and the organization dies.

A brief description of Utah's plan which has worked successfully may not be out of place. Some years ago local men were selected in each county and appointed county chairmen, being chosen because of influence in the county and spent considerable time in keeping us in touch with and interest in educational work. They represented the extension division and were particularly helpful in preparing a county for a food agent. When the call for increased production came, the chairmen were called together and given a plan for organization to be followed in their several counties. This organization was called the "food production and conservation bureau" and was patterned along farm bureau lines. No dues were called for in this temporary organization. A local branch was formed in each town or village, which appointed a member to represent it in the central county committee, of which the county chairman was leader. Thus the extension division was kept in close touch with the work. These emergency bureaus did effective work and kept alive until the emergency funds were available.

This organization was now ready for the paid worker and in most cases secured financial cooperation from the county commissioners. As soon as the local agent was appointed he had an organization to work with and it did not take him long to change it into a regular farm bureau. The same general plan was followed in the inauguration of the work with women.

The temporary organization for food production and conservation not only furnished a useful organization enabling considerable work to be done before the regular agent was appointed but was useful in other ways in securing financial cooperation from the county and quickly affording the agent a county-wide acquaintance with the people and their problems.

In Western States the county organization may well consist of a local bureau in each town or district and a county central committee or board of directors made up of representatives from each of these locals.

If strong local organizations other than farm bureaus are already at work, some kind of cooperation should be undertaken so that harmony will prevail in the county. There is no time for argument and energy is too valuable to be wasted in duplication of work or in county or community strife. A simple but broad and comprehensive plan of organization for real work along definite lines is suggested.

THE CHAIRMAN. The rapid development of woman's work has raised again in the minds of extension directors the question of just how to correlate the activities of the women workers with those of the men workers. Director C. A. Keffer of Tennessee will discuss this question.

CORRELATION OF HOME DEMONSTRATION WITH COUNTY AGENT WORK

BY C. A. KEFFER

We have three large districts in Tennessee, in each of which a three-day institute is conducted. Shortly after the passage of the Smith-Lever

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Act, I was asked to speak before the homemaker's section of the West Tennessee district. The chairman, introducing me, said, "Mr. Keffer will now tell us how much of the Smith-Lever money the women are going to get." That seemed to be the prevalent impression at that time as to the relationship between men's work and women's work in the extension service. It was not a question of how they would get together but as to the division of the spoils.

There can be no separation of men's work and women's work in matters pertaining to rural life. Their purposes are identical. Both work for the betterment of rural conditions; and if this is not brought about money and efforts will have been expended in vain. I can not see how it is possible for the women not to be interested in the crops, livestock, field work, in everything that pertains to the out-of-doors farm activities; and on the other hand, since the man must live in the house, I hardly see how he can fail to be interested in all that pertains to the farm home life. There should be no separation of interests. On the question of how best to bring these interests into development, of course people may differ.

At the outset the man and woman county agents should office together. While one deals with outside and the other with inside activities, both are equally interested in community development and in the social affairs of rural life, and if they office together at least they will be able frequently to confer, which promotes mutual understanding. I have in mind a Tennessee county in which the man agent was appointed about two years in advance of the woman agent. He had difficulty in getting hold of some of his farmers in a certain district. He could not get them interested in demonstrations. They were well satisfied with what they were doing. They did not think that a young fellow could show them what to do. When the woman agent went to work, however, she found the women more amenable to suggestions than the men. Her success was marked from the outset. The man agent recounted his woes to the woman agent, who said, "You have not got hold of the right people; that is what is the matter with you." He replied that he had already approached practically every one in that district, and she said that she would help him out. The next morning she called the attention of a few of the leading women in that section to the fact that their husbands, who really were the leaders of the community, ought to promote every good work there; and she made those women believe it. It is needless to say that the women made their husbands believe it also. The work now succeeds in the place where it failed.

The man and the woman agents can well work together at street or community fairs. I recently attended a community fair in a county in which our agents had been at work, the man for a year, the woman for three months. It was the first fair of any kind held in that county since 1860. There were exhibits of livestock, some cattle, indifferently good, three pens of hogs, rather better, two pens of sheep, very good indeed, and perhaps a dozen coops of chicken. The exhibits of agricultural products included the corn grown by boys in three or four corn clubs. It would have won prizes at any state fair in the United States. The pride that those people took in their boys' corn was gratifying to behold. The exhibit of women's work, included an excellent output of canned goods, etc. Now the salient feature of this situation is this: This county was split wide open with sectional jealousies. Little or no community consciousness

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was displayed. These two agents, clearly understanding that their function was to develop community consciousness and to work through the community to the individual, notwithstanding adverse conditions, had brought together for the first time in 57 years a crowd of people working and acting in harmony. The agents had vision and did team work; and they got their people to see and to act.

Each county in Tennessee is a little commonwealth. It has its own county court, made up of from a dozen to 40 folks. Every county appropriation is passed upon by this county court. It is about as hard to get an appropriation through some of these courts as it is to get one through Congress, often because of lack of local support for our work. The county court is made up of two magistrates from each district in the county. These men are influenced mainly by local public opinion. One of our great problems is how to secure and hold this local opinion. In securing support for our work it is of prime importance that both the man agent and the woman agent serve the communities. There are some difficulties in the way, particularly along lines of expense accounts. With us each agent pays his or her own expense accounts. Our salaries average less than $1,500. The agents must economize. Indeed some of them have thrown themselves into the campaigns for increased food production and conservation to such an extent and have expended from their meagre stipends so freely that some of them are coming out at the end of the year minus instead of plus as to their incomes. They have not spared themselves or counted the cost in the performance of duty. I do not believe there is a more patriotic lot of people in the land than the men and women county agents. One man agent and woman agent sought to lessen their expense accounts by traveling together. It did not do. Folks are prone to attend to other folks' affairs, and the affairs of the county agents are peculiarly the affairs of the county. It was not very long before the woman was embarrassed by inquiries as to when the wedding would take place. Cooperation between men and women agents should not go to that extent. Cooperation in the office, in planning, in the promotion of community organization and development, in securing support for extension work, is desirable; but it should not go to the extent of placing their demonstrations out-of-doors and indoors upon the same farm, or of being seen together continuously in public, lest it cause them embarrassment. However, it is well once or twice a year to have simultaneous demonstrations for the women and for the men on the same farm. This serves to focus the attention of the public upon the fact that these two lines of work are and of right ought to be closely correlated.

The work of the men and of the women agents cannot be disassociated. The more complete the harmony of their action, the closer their understanding and cooperation, the more successful will be their work.

THE CHAIRMAN. The discussion will be continued by Miss Florence E. Ward of the States Relations Service. Miss Ward has charge of women's work in the Northern and Western States.

MISS FLORENCE E. WARD. I heartily agree with the point of view of the last speaker with reference to the importance of close correlation of all extension work carried on within a county. The man agent, the home demonstration agent, the boys' and girls' club worker, are all dealing with an institution, the home, which spells cooperation and correlation throughout.

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Here men, women and children form a working unit with common interests and aims. It would be inconsistent and unpedagogical for extension workers in agriculture and home economics, in dealing with this family unit, to attempt to carry on any piece of work as isolated and detached from the unified service to the family. The man and woman agent are working in the same territory, dealing with the same groups, confronted with the same economic and social problems and working toward the same goal, which is the real enrichment of American rural life; hence the necessity for harmonious and intelligent teamwork. The immediate aim in both types of work is economic prosperity on the farm and in the farm home, where family partnership is necessary to success. The man agent has largely to do with production, the woman agent with utilization, thus dealing with two phases of one problem. There is overlapping of effort and service on the part of these workers wherever the farm woman's interest and activity goes beyond the threshold of her home into the outside industries of gardening, poultry keeping, bee keeping, and marketing of home products, or where the man's interest and skill are applied in making the home a more comfortable place to live in, as in looking after the home water supply.

I believe that as the scope and possibilities of this work come to be understood, men and women, working through the extension service for the advancement of rural, community and home life, will grow more and more to appreciate the necessity for a program which, while it leaves each supreme in his or her special field, gives due recognition to the relationship between phases of one piece of work, which, when rounded out and fitted together, serves every member of the family and community.

Alva Agee of New Jersey. The Executive Committee, consisting of five men, represents our Association throughout the year in its dealings with Congress and with other bodies. Three members are named by the section on college work and administration and two by the section on experiment station work. I doubt the wisdom of attempting a change in the Constitution touching this matter. The Executive Committee should be representative of the Association as a whole rather than of any one section. Its chairman tells me that there is no reason why the extension section may not make a suggestion to the college section respecting the advisability of including in the membership of the Executive Committee some one who would be fully conversant with our needs as extension people. If it were wholly in order and in good taste I should like to tell you that the chairman of the committee on extension organization and policy has given close attention to all of the items of business and to all of the committee duties for several years, that he is thoroughly conversant with our special needs, and that, in my judgment, he is peculiarly fitted for membership upon the Executive Committee. I have no right to name any one unless every one else has an equal right. With that understanding, however, I move that this section suggest to the section on college work and administration that it would be pleased to have it consider the name of C. W. Pugsley when it makes its recommendations for membership on the Executive Committee for the ensuing year.

The motion, being seconded, was carried.

A. C. True. Word has been sent to each extension director of the

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formation, under the direction of the President of the United States, of a speaking division of the Committee on Public Information. Plans have been made to institute throughout the country during the next few months a speaking campaign dealing with patriotic topics. This speaking division is desirous of knowing about the important meetings. We have already received some information from directors of extension work, which we have transmitted to the chief of that division. They should not fail to keep us informed of all such meetings.

Because of the emergency appropriation a large and complicated burden has been put upon the accounting officers of the States Relations Service. On this account, as well as because of the necessary changes and expansion in the accounting office, our accounts have not in all cases been passed as rapidly as we would like; but we are doing the best we can. The new agents, of course, do not understand government regulations which are necessary to the proper expenditure and accounting of public funds. Our chief accounting officer is very desirous of helping the extension directors in any way that he can toward an understanding of the situation and of any details of the work in which they would be interested, or to answer questions.

On motion, the section took a recess until Friday, November 16 at 2 P. M.

Afternoon Session, Friday, November 16, 1917

The section was called to order at 2 P. M. by the chairman.

The Chairman. Mr. Geo. W. Rommel, Animal Husbandman in the Federal Department of Agriculture, will discuss the 1918 pork production campaign.

The War Program Suggested by the United States Department of Agriculture for 1918 Pork Production

By G. M. Rommel

Your chairman has courteously requested me to present an outline of the plans of the Department of Agriculture for encouraging an increase in pork production in 1918, in cooperation with the extension divisions of the agricultural colleges. This plan has been worked out after careful consultation with the authorities in touch with our export demands. It has been determined that in order to meet the demands made upon us for government and allied account in 1918 it will be necessary for the farmers of the United States to increase their pork output by 15 percent. This has been allotted by the bureau of crop estimates on the basis of the 1917 corn crop, the allotment to different States appearing in the detailed plan which I am presenting herewith.

In States which are not being called upon for an actual increase in pork production, at least as much pork should be produced in 1918 as heretofore. Your attention is especially called to the fact that there has been a decrease in the number of hogs slaughtered in the United States, not only in actual numbers but in the total volume of pork produced, the hogs marketed during the fiscal year 1917 being considerably lighter than those marketed during the year 1916. The most important problem in

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this connection, so far as the business of farmers is concerned, is the necessity of disposing economically of the enormous 1917 corn crop. The figures of this crop presented in the attached outline (page —) are based on the November 1 estimates. These figures will be revised as soon as the December estimates are available. The probalities are that there will be no material changes.

Your attention is especially invited to the fact that the grain production in the United States in 1917 aggregates in the total more than 950,000,000 bushels over the production in 1916. Obviously the major portion of the corn crop increase must be fed to live stock. Of course it is desirable to replace as much of the wheat consumption in the United States by corn as possible, but we must not lose sight of the fact that our corn is grown not for human food but for animal food. We produced in the United States this year about 30 bushels per capita of corn. It is absolutely impossible for us to eat all this corn. European nations do not eat corn and cannot readily be taught to eat it. It is therefore our problem to save our wheat so that we may have a surplus to send to Europe. However, our per capita wheat consumption is normally about 5.3 bushels. This year, I believe, statisticians estimate that the per capita has been reduced to about 4.6 bushels, and it is hoped that it may be yet further reduced to 4 bushels. If, therefore, we should entirely replace our entire wheat consumption with corn we would make comparatively little impression on the total corn crop. The market for corn is found by feeding it to livestock, not by feeding it to human beings. If we try to market the corn crop by feeding it to human beings we are not going to market it at all. It is conservatively estimated that from 75 to 80 percent of the corn crop is marketed by means of livestock, and the bureau of crop estimates stated just before the war that the proportion of the corn crop fed to livestock was about 85 percent. Clearly, in drawing these inferences concerning the grain crops, the Department has been very conservative.

It is asserted that in excess of 20 percent of the corn crop in 1917 is soft, varying from 25 percent in Missouri, Kansas and Nebraska to 35 percent in Iowa and Illinois and 45 percent in Indiana. In the northern tier of States there is very little, if any, sound corn. Some soft corn is found as far south as East Tennessee, but this has not seriously affected the crop in the locality, as most of it has been fed or is in the silo.

Now suppose we estimate that we market direct 20 percent of the crop for disposition as human food, in the arts, manufactures, etc.; that 20 percent is soft and must be fed to cattle and other animals as best we can; and that 30 percent is normally fed to hogs, a total of 70 percent of the crop. What becomes of the remaining 30 percent? If it is thrown on a market that already has its 20 percent, or 600,000,000 bushels, taken care of, you can imagine what will happen to the price of corn. Extension directors should take this matter to heart as a serious question.

Your attention is called to the fact that at the end of the department's statement figures are included as to the southern corn crop, which shows an increase of almost 120,000,000 bushels over 1916. The yields in certain Northern States are also included. The decreased yields of Louisiana, Texas and Oklahoma due to drought conditions are deducted from the aggregate of the southern crop. The estimate of the increase of 120,000,000 bushels in the southern crop is net.

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We are approaching the problem of increased production in two ways: In the corn belt we propose to make the drive directly on increased production, with pig club organization as a secondary feature. In the Southern States we are making the main drive on the increase in pig club membership, with direct pork production as secondary. We do not by any means believe that the increase in production in the Southern States should be neglected, but we have found from experience that the pig clubs have acted as a wonderful stimulus to the increase in the swine yield in that section. They are as a rule rather better organized in the South than elsewhere. Therefore we are taking advantage of conditions as we find them. It does not require argument to demonstrate the fact that the greatest aggregate increase in the pork output of the country must come from the centers of heaviest production. Therefore we propose to work most strenuously with the Corn Belt States.

The Department is not attempting to dictate how this campaign is to be carried out. We have simply said to each director: "Here is a problem that must be solved. We need pork to win this war. We are all in the war whether we wear uniforms or not." Therefore we have put before each extension director what we expect in his State, and it is up to him to get the results. If they will supply the ways we will supply the means. The extension director knows best how to carry on the program in his State and if he will supply the details of organization, the Department will see that he gets the funds to finance the program. It is not necessarily carried out in the same way in any two States. In many places no general meetings will be held except of county agents in conference, the State going directly to country bankers and putting the program before them. There is no question that the country banker is behind anything which the Government proposes as a war measure—the Liberty Loan and things of that sort. When one of his farmer customers comes in and talks about next year's work the banker can tell him about the hog situation and urge him to increase his production. The press can be worked in the same way.

In other States experienced farmers and hog raisers have been drafted for service in the campaign and are at work in a strenuous drive, holding meetings in every hog producing county in the State. We have insisted on only one thing, that the director of extension select in each State some man who will be responsible as the leader for the state campaign and whom he can hold personally responsible for results. This leader should have an assistant. This feature is necessary simply because we cannot allow the matter to take its own course and trust in Providence that the work will be successful.

Extension directors have been more than loyal. They have been perfectly willing to take men right out of their organizations and put them into this campaign, feeling that somehow they could carry on the work which these men had been doing before they took up the work in pork production. The Department has taken over part or all of the salaries of the leaders, as desired.

In the irrigated West we are asking the States Relations Service to circularize the extension directors and county agents to urge farmers to increase their pork production as much as possible. If they should develop their production there would not be enough to cause an over-production for the whole country. We are urging that as many as possible of the pigs born next spring on irrigation farms be finished out as far as may be

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practicable at home, while farmers who do not have the grain to finish out hogs will have an outlet for them as feeders in the corn belt. Many sections of the corn belt are dependent on feeders from outside sources and are already buying from the western irrigation farms. It is also possible that some of the dry farmers of the West can help by adding to the country's supply of hogs.

SLAUGHTER OF HOGS

Federal Inspection—Fiscal year ending June 30

1916	40,482,000
1917	40,210,000
Decrease	272,000

It is quite accurately estimated that the slaughter of hogs under federal inspection represents 60 percent of the total slaughter of the United States. On this basis we therefore find the following estimate for the total slaughter of the country for the two fiscal years in question.

Total slaughter—estimated

1916	67,470,000
1917	67,020,000
Decrease	450,000

It should be pointed out that the actual decrease in the amount of pork produced is greater than the figures above would indicate. The hogs slaughtered during the fiscal year of 1917 were much lighter in weight than those marketed in the previous year. Further indication of the decrease in swine production is found in the report of the bureau of crop estimates of the United States Department of Agriculture for hogs on farms September 1.

Hogs on farms, September 1

1916	65,645,000
1917	60,218,000
Decrease	5,427,000

The 1917 cereal production in the United States is much greater than it was in 1916. The estimate of the corn crop on November 1 by the United States Department of Agriculture was 3,191,083,000 bushels; the December estimate of 1916 crop by the same authority was 2,583,241,000 bushels. The five-year average for the years 1911-1915 was 2,754,165,000 bushels. The increase of the 1917 year over that of 1916 based on the November estimate is 607,842,000 bushels. The increase in 1917 over the five-year average is 438,832,000 bushels.

The Department of Agriculture estimates an excess of 20 percent of the corn crop to be soft. This soft corn must be fed to livestock. However, in view of the heavy southern crop (which is in unusually good condition) and the fact that most of the corn crop is always fed to livestock, it is a safe statement to say that there will still be an abundance of corn of a marketable quality to meet the usual market demands and insure reasonable prices for corn for feeders who must purchase grain. The

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following brief survey of the grain increase in the country should be considered.

CEREALS

Increase 1917 over 1916

Corn	500,000,000–607,000,000	bushels
Oats	328,000,000	"
Barley	20,000,000	"
Rye	8,000,000	"
	856,000,000–963,000,000	"
Wheat shortage	300,000,000	"
Net	556,000,000–663,000,000	"

The very extensive campaign now in progress to replace as much wheat as possible with corn should be encouraged in every possible way. However, the corn production of the country is above 30 bushels per capita. The normal wheat consumption is about 5.5 bushels per capita. It is apparent that if it were possible to replace the entire wheat consumption in the United States with corn or other grains, there would still remain a very large grain surplus. If we even assume the wheat shortage to be 300,000,000 bushels and subtract the entire amount from the minimum grain increase indicated above, we should still have a net grain increase of 556,000,000 bushels as a minimum with the possibility that this amount will be over 600,000,000 bushels.

Stocks of old corn on farms November 1 are estimated at 34,745,000 bushels (1.3 percent of the 1916 crop), compared with 87,908,000 bushels on hand a year ago and an average for five years of 100,523,000 bushels. If we charge off this shortage against the 1917 crop, we still have a huge surplus:

1917 Grain surplus minimum	856,000,000	bushels
Less assumed wheat shortage	300,000,000	"
	556,000,000	"
Less difference in stocks of corn on farms	53,000,000	"
Net grain surplus	503,000,000	"
Or, less difference in hold-over corn, five-year average basis	490,000,000	"

It should be noted that the above calculations are based on an increase of 500,000,000 bushels in the 1917 corn crop over 1916. The Government estimate for November shows an increase of over 607,000,000 bushels. This estimate is very close to the actual yield. As a matter of fact, therefore, the December estimates will probably show an increase in the cereals available for feed of more than 950,000,000 bushels over 1916. The duty of American farmers to themselves and to the Nation is clear. Livestock production, especially hog raising, must be increased, for the reason that livestock makes the corn crop marketable, in view of the fact that 75 to 80 percent of a normal crop is fed.

When the crop is greatly increased above normal, a still greater proportion must be fed in order to make the remainder marketable at a profit.

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If there should be a serious shortage of hogs in the country in 1918, there will be more corn on hand than the market can absorb. The increase in 1917 corn crop over that of 1916 is more than 15 percent. The demands on the country for domestic consumption and for export require an increase of 15 percent in pork production in 1918. The corn crop increase and the pork production requirements therefore coincide in theory and must coincide in practice in order to avoid serious declines in the price of corn. The increase in cattle feeding in the corn belt can be depended upon largely to take care of the soft corn situation in the States which are called upon for an increase in pork production.

The following statement shows the requirements or, rather, allotments of each State which is asked to increase swine production next year:

INCREASE IN PORK PRODUCTION IN 1918
Entire United States, 15 percent over 1917

State	Increase for 1918 Percent	Interpretation
Missouri	50	Where a farmer bred 20 sows in the fall of 1916, he should breed 30 in the fall of 1917.
Alabama	30	Where a farmer bred 20 sows in the fall of 1916, he should breed 26 in the fall of 1917.
Kansas	25	Where a farmer bred 20 sows in the fall of 1916, he should breed 25 in the fall of 1917.
Iowa	25	Where a farmer bred 20 sows in the fall of 1916, he should breed 25 in the fall of 1917.
Illinois	20	Where a farmer bred 20 sows in the fall of 1916, he should breed 24 in the fall of 1917.
Indiana	20	Where a farmer bred 20 sows in the fall of 1916, he should breed 24 in the fall of 1917.
Nebraska	20	Where a farmer bred 20 sows in the fall of 1916, he should breed 24 in the fall of 1917.
Arkansas	20	Where a farmer bred 20 sows in the fall of 1916, he should breed 24 in the fall of 1917.
Mississippi	20	Where a farmer bred 20 sows in the fall of 1916, he should breed 24 in the fall of 1917.
Ohio	15	Where a farmer bred 20 sows in the fall of 1916, he should breed 23 in the fall of 1917.
Kentucky	15	Where a farmer bred 20 sows in the fall of 1916, he should breed 23 in the fall of 1917.
Tennessee	15	Where a farmer bred 20 sows in the fall of 1916, he should breed 23 in the fall of 1917.
South Carolina	15	Where a farmer bred 20 sows in the fall of 1916, he should breed 23 in the fall of 1917.
South Dakota	10	Where a farmer bred 20 sows in the fall of 1916, he should breed 22 in the fall of 1917.
Maryland	10	Where a farmer bred 20 sows in the fall of 1916, he should breed 22 in the fall of 1917.
North Carolina	10	Where a farmer bred 20 sows in the fall of 1916, he should breed 22 in the fall of 1917.
West Virginia	5	Where a farmer bred 20 sows in the fall of 1916, he should breed 21 in the fall of 1917.

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Farmers who do not breed as many as 20 sows can readily calculate the amount of increase which they should make in order to "do their bit." For example, if a farmer bred four sows in the fall of 1916 and breeds five in the fall of 1917, he contributes at the rate of a 25 percent increase. If he bred 10 sows in 1916 and breeds 11 in 1917, he shares in a 10 percent increase. If he bred only two sows in 1916, and breeds three in 1917, he contributes exactly his quota if he lives in Missouri.

The supply of breeding sows is undoubtedly short this fall. The breeding ranks will have to be filled to a considerable extent with gilts from the feed lots. These gilts will not produce quite so large litters as mature sows may be expected to produce, and farmers using gilts should breed slightly above the prescribed quotas in order to insure the requisite increase in spring pigs.

Attention should be given to the fact that this program has been carefully worked out according to the known requirements for 1918. If it is met in every detail, these requirements will be fulfilled. If the farmer breeders of the various states do not reach the quotas set forth for them, a more acute shortage of pork products will result than now prevails, extremely high prices for hams, bacon and lard will prevail and only a few "wise ones" will benefit, the consumer suffering from extremely high prices and a shortage of necessary animal fats. On the other hand, if the program is carried out, a market is provided for about one-third of the 1917 corn crop, the demands on the country for pork products can be met without strain, prices to the producer should be remunerative and those paid by the consumer should be reasonable. The country banker will endorse a systematic business-like plan such as herein outlined.

There are given below November estimates of the 1917 corn crop of certain States with which are compared the yields for these States in 1916.

SOUTHERN CORN CROP

1917	937,121,000	bushels
1916	819,022,000	"
Increase	118,099,000	bushels

This increase is approximately 20 percent of the total increase of the Nation.

	1917	1916	Increase 1917
Maryland	30,576,000	27,300,000	3,276,000
Virginia	71,369,000	60,990,000	10,379,000
West Virginia	25,020,000	22,112,000	2,908,000
South Carolina	43,947,000	32,008,000	11,939,000
Georgia	71,680,000	62,000,000	9,680,000

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	1917	1916	Increase 1917	Decrease 1917
Florida	14,270,000	12,600,000	1,770,000	.....
Kentucky	124,372,000	95,200,000	29,172,000	.....
Tennessee	109,200,000	84,500,000	24,700,000	.....
Alabama	74,704,000	46,688,000	28,016,000	.....
Mississippi	81,600,000	47,600,000	34,000,000	.....
Louisiana	42,246,000	44,814,000	.....	2,568,000
Texas	78,936,000	131,100,000	.....	52,164,000
Oklahoma	36,261,000	53,325,000	.....	17,064,000
Arkansas	66,720,000	45,135,000	21,585,000	.....
	937,121,000	819,022,000	189,895,000	71,796,000

Net increase 118,099,000 bushels.

CORN CROP IN CERTAIN NORTHERN STATES

	1917	1916	Increase 1917
Ohio	156,408,000	115,762,000	40,646,000
Indiana	203,436,000	174,658,000	28,778,000
Illinois	426,816,000	306,800,000	120,016,000
Iowa	412,772,000	366,825,000	45,947,000
Missouri	265,900,000	132,112,000	131,088,000
South Dakota	92,512,000	84,075,000	8,437,000
Nebraska	259,740,000	192,400,000	67,340,000
Kansas	128,436,000	69,500,000	58,936,000

T. F. HUNT. Suppose a man in Nevada, for example, keeps his feeders, to whom will he sell them?

G. M. ROMMEL. California has been growing considerable pork of late. I suggest that the Nevada pigs be sent to points where prime beef and pork are being made. There may be other outlets for them than California, but Arizona ships to Kansas, and Idaho to Nebraska. In certain sections some of the corn belt farms have become so seriously infected with necrosis that pigs cannot be raised. The farmers have gone out of the breeding business there, are dependent on feeders, are paying the freight charges and making money. The question has been raised whether farmers might not abandon the breeding of sows and buy 100-pound pigs in the spring. They have been advised otherwise. Some people have had orders in for months for 100-pounds pigs and have been unable to secure them. They feel that it will be impossible to buy feeders next spring. There ought to be a good market for hogs at that time. We ought to put men in the field and get a line on this supply so as to be certain about it. We expect to use our organization for the purpose of locating these markets. For example, take Illinois. We will have to ask Messrs. Handschin and Carmichael how many feeders they need, and then will notify the people in the irrigated west, "Here is a demand for so many hogs." If they are sent directly without passing through a public stockyard, so much the better.

F. MUTCHLER of Kentucky. What can you say concerning the relation fixed between corn and hogs?

G. M. ROMMEL. That matter has a direct bearing on our program. In the first place, I understand that the ratio of 13 to 1 which was made

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was fixed on the Chicago prices for corn and for hogs, and the latter, of course, sets the price all over the country. In other words, if the farmer down in Georgia, for example, where corn sells ordinarily for much more than it does in Chicago, should figure out that he was going to get two or three times the price for his hogs, he would be badly disappointed when they got to market.

F. MUTCHLER. Is not that already making the price for hogs somewhat bearish? It is said, and seriously too, that there will be a sharp fall in prices in February, following the enormous amount of pork likely to be placed on the market in January.

G. M. ROMMEL. I can make no predictions, but will ask you a question. The price of hogs has always gone off in October when the spring crop begins to come in. This could have been predicted ten years ago. Yet after the first slump of around $3 per 100 pounds, the market recovered more than $1 during the last five days of October. Do you know why? It did what it never had done before. Theoretically, hogs should have kept on going down until after January and then come back.

F. MUTCHLER. They went down too far. The idea was circulated that the Food Administration intended to fix the price at ten cents, followed by a counteracting idea that a relation would be established, and that probably it would be 13 to 1. At once they began to be put on sale. They are bearish now, due to the fact that the midwestern people are trying to keep down the price of corn in order that a large amount may be available to feed hogs.

T. F. HUNT. Has the ratio of 13 to 1 been officially fixed? To whom can one turn in order to find out with certainty what the prices are? I appealed to the Food Administration and was informed that the statements made by its Mr. Cotton in the *Chicago Daily Drovers' Journal* of November 3 were official and that we could act upon them.

L. A. CLINTON. About a week ago Mr. Hoover wrote the Department of Agriculture to the effect that a ratio of 13 to 1 had been established. We felt that this statement would convey a wrong impression, that farmers would infer that this ratio was meant to be applied at the farm, just as they have got the impression that $2 wheat meant wheat at the farm. We asked some modification of the statement be issued showing that the ratio would be 13 to 1 at some center, but have not yet heard from him in reply.

G. M. ROMMEL. The Cotton statement reads as follows:

CHICAGO DAILY DROVERS' JOURNAL

Saturday, November 3, 1917

Increased Production on Profitable Basis Assured by United States Action

"Joseph D. Cotton, chief of the United States Food Administration, Meat Division, today issued the following statement relative to the prices of hogs:

"The main purposes of the Food Administration as to hogs are:

"To see that the producer at all times can count on a fair price for his hogs so that it will be profitable to him;

"To see that the farmer increases the number of hogs bred:

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"To limit the profit of the packer and the middleman; and
"To eliminate speculation.

"All these purposes are necessary, because we must have more hogs so that the ultimate consumer can at all times get an adequate supply of meat at the lowest feasible price.

We shall establish rigid control of the packers. Fair prices to the farmers for his hogs, we believe, will be brought about by the full control which the Food Administration has over the buying of the Allies, our Army and Navy, the Red Cross, the Belgian Relief and the neutrals, which together constitute a considerable factor in the market.

"The first step is to stop the sudden break in prices paid for hogs at the central markets. Those prices must become stable so that the farmer knows where he stands and will feel justified in increasing hogs for the next winter. The prices, so far as we can effect them, will not go below a minimum of about 15.50 per cwt. for the average of the packers' droves on the Chicago market until further notice.

"We have had, and shall have, the advice of a board composed of practical hog growers and experts. That board advises that the best yardstick to measure the cost of production of the hog is the cost of corn. That board further advises that the ratio of corn prices to hog prices on the average over a series of years has been about twelve to one (or a little less) in the past.

"When the ratio has gone lower than twelve to one the stock of hogs in the country has decreased. When it was higher than twelve, the hogs have increased.

"That board has given its judgment that to bring the stock of hogs back to normal under present conditions the ratio should be about thirteen.

"Therefore, as to hogs farrowed next spring: We will try to stabilize the price so that the farmer can count on getting for each 100 pounds of hog ready for market 13 times the average cost per bushel of the corn fed to the hog.

"Let there be no misunderstanding of this statement. It is not a guarantee backed by money. It is not a promise by the packers. It is a statement of the intention and policy of the Food Administration, which means to do justice to the farmer."

A. F. Woods of Maryland. I have heard two very different statements, namely, that the ratio would apply to the farm and that it would hold only at Chicago. Which is correct?

G. M. Rommel. Mr. Cotton's statement reads as follows:

"The prices, so far as we can affect them, will not go below a minimum of about $15.50 per cwt. for the average of the packers' droves on the Chicago market until further notice. * * * * * * * Therefore, as to hogs farrowed next spring: We will try to stabilize the price so that the farmer can count on getting for each 100 pounds of hog ready for market 13 times the average cost per bushel of the corn fed to the hog."

A. F. Woods. That statement implies that that is what the farmer gets for feeding his hogs. If it does not mean what it says, if the farmer does not receive returns according to this ratio, there will be trouble.

G. M. Rommel. I do not understand that this statement implies farm prices, but on the contrary, that it is based on Chicago prices.

Bradford Knapp of Washington, D. C. It will not and can not be true. Taking the country over relatively with the corn belt and in the Central States it will be true; but in the South it will not and can not be true. When the statement first came to the Department I called attention to the fact that if it was sent out in the language stated to the farmers generally there would be a distinct misunderstanding regarding its meaning. Therefore, it was returned to the Food Administration and they are revising it

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and trying so to phrase it that will be perfectly clear. Relatively speaking, there will not be much difference, as I see it, in the States where both corn and hogs are heavily produced, where corn and hog prices are fixed on the market; but as to Georgia and Alabama there will be a difference, because the prices of corn are not much above the Chicago prices.

G. M. ROMMEL. On the statement made—I am quoting and not speaking on my own authority—the average price of corn in Chicago, taken by and large, makes the price of hogs in Chicago and the price of hogs in Chicago determines what the price will be everywhere else in the country. That is the whole matter. If that is clearly understood the situation referred to will be made plain.

THE CHAIRMAN. Will Director G. I. Christie of Purdue University tell us of the Indiana campaign?

G. I. CHRISTIE. The Government issued word a few weeks ago that it would like to see a movement started in the Central West to increase pork production. A meeting of hog breeders and feeders was called October 30 at Purdue University. More than 150 of our big breeders and feeders were present. Everybody was frank in what he had to say, everybody had a chance to talk and many difficulties were ironed out. Strong resolutions were passed, wired to the Secretary of Agriculture and the Food Administration. We appointed our regular animal husbandry man as leader and we decided immediately to put on a special campaign. We called all of the emergency men and the county agents into conference, organized them, placed directions, literature and helpful posters in their hands and told them to go back to their counties and arrange for from five to eight meetings. Of our 78 agents, 77 responded. In the meantime, we invited 15 prominent hog breeders to become members of our staff and to spend from two to three weeks lecturing at these meetings arranged by the county and emergency agents.

Our first meeting was held in a nearby town. After one of our breeders had spoken, one old man said, "I am glad that I heard you, for my mind is changed as to the hog situation. I have 25 sows in the feed lot and I am going straight home and take them out and raise pigs." Others did the same thing. I believe the way to do this thing at the outset is to organize a forcible drive, sending men with the message directly to the farmers, telling them the story, answering their questions and straightening matters out in their minds. Much work, of course, must be done this winter. Just putting sows into the breeding pen will not necessarily mean pigs next spring. Care, housing and management that only thoroughly informed men can give will make a successful season. We feel that this initial drive is only a beginning to a successful hog campaign; that our leaders and other men must be on their tiptoes every minute, getting out helpful circular letters, leaflets, suggestions for better housing, feeding and management of brood sows. In view of the impetus which the Bureau of Animal Industry has given to the movement; in view of the statement from the Food Administration that the farmer will be protected, that if he feeds high priced corn to his hogs he will be taken care of next summer; taking into account the patriotic feeling in the hearts of all men, knowing that we need to feed the boys that are going

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to France, it would seem that we ought to make more pork than ever before.

G. M. Rommel. The follow-up work after the initial drive is accomplished will be really of greater importance than the early work and constitutes one of the best arguments for a strong leader and a good assistant.

The Chairman. We are conducting a personal work campaign in Iowa. Each banker will be visited personally, the situation explained to him and he will be asked to do personal work with the farmers who come in to do business with him. Prominent farmers and members of the State Council of Defense will be asked to give assistance. Publicity will be carried on through the papers.

The personal work campaign apparently suits our conditions better than any other, especially for the next six weeks. During the winter an educational campaign on the feeding, care and management of hogs will be carried on.

We discussed methods of organization on Wednesday, but organization for organization's sake alone is not worth much. This afternoon we are to discuss some of the things that organization can do. If our farmers are to supply the armies with food and men they must be thoroughly organized. Nebraska made first class progress along the line of meeting the farm labor shortage and Director C. W. Pugsley of the University of Nebraska has been asked to discuss farm labor bureaus.

Methods of Meeting the Farm Labor Shortage: Organization of Farm Labor Bureaus

By C. W. Pugsley

In common with the rest of the country Nebraska has faced a very serious farm labor problem, one that needs attention; yet the shortage in some sections apparently has been overestimated. We had the feeling that if some of the retired farmers, some of the people who are not working very much around our towns, some of the clerks in the stores and the banks would turn to, we might be able to take care of the summer situation. So our organization plan was carried out on that basis. Our plan, briefly, was this. In every county where we had a county agent, he was made the leader of the county farm labor bureau. He was the farm labor representative who looked after county needs. He had local assistants and local committees of men acquainted with the local labor conditions. The assistant might be secretary of a commercial club who had time to give to the work, a country preacher, the secretary of a grange, a farmers' union, etc., anyone who was interested and who was willing to devote some time to the work.

In counties where there were no agents, a county leader was chosen wherever possible. This county labor leader might be some interested person who would agree to devote sufficient time to the work, for example, the secretary of the shire town or some large towns, the secretary of the commercial club, the president or secretary of the county farmers' organization, a prominent grange or farmers' union worker. If a suitable man could not be secured to act as the county farm labor leader, the local labor bureau reported direct to the state labor agent. We had, of course, immediately appointed a man who was afterwards made labor leader for

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the State, as a part of the emergency work. The farm management demonstrator also devoted some time to that work.

Attention was given at once to the question of the organization of the local bureaus. Five college people devoted an entire week, two or three others from two to three weeks, the state labor leader was at work every minute. Several counties organized without assistance, and some people not connected with the college or the extension service gave time and thought to this work.

There are practically 300 local labor bureaus organized all over Nebraska. Some counties have bureaus and others have not. If there is not a county organization, report is made directly to the central office.

We were confronted with the matter of reports. We wanted to know what the labor situation was. We felt that if there was a shortage of labor in any community, it might be possible to supply it from a nearby neighborhood. We did not think it was necessary to go outside of the State for much labor and we were right. The labor shortage was not nearly as acute as we were afraid it would be earlier in the spring. Ninety percent or more of the labor bureaus have been active wherever there was a demand for their services. In several communities, however, there was really no work for them to do, because there was no shortage of labor; but wherever such existed we have found them actively engaged whenever a shortage seemed imminent; their first job was to see if a sufficient supply of labor to supply the farmers could not be found in the towns, or in their own communities; and in most instances such was found to be the case. If they could not secure labor, they let the state labor leader know about it and he got in touch with the local labor bureaus in the immediate vicinity of the shortage and asked them to strive to help their neighbors. In most instances a sufficient supply of labor was found in surrounding counties. If it could not be found there, or if the shortage was general and acute, then the state labor agent took up the matter with the labor leaders in other States. These 300 local bureaus have supplied about 10,000 laborers outside of their local territories. We have no exact record of the number of laborers supplied by local bureaus within their own territories, but the figure is a large one.

THE CHAIRMAN. The discussion will be continued by Director W. D. Hurd of the Massachusetts Agricultural College, who will discuss "The Utilization of Non-Productive Labor."

THE UTILIZATION OF NON-PRODUCTIVE OR PARTIALLY NON-PRODUCTIVE LABOR IN THE FARM LABOR SHORTAGE

BY W. D. HURD

That the existing shortage of farm laborers is the greatest deterrent to increased crop and animal production is a fact which I think everyone will admit without argument. Fruits, vegetables and grains, in spite of all that has been written and said this year, have been wasted in certain sections of the country because there has been no available labor to care for them.

There are several good reasons which seem responsible for this shortage. For years farm life and labor have not been as attractive to country boys as have city life and labor in commercial concerns and industries;

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therefore a constant stream of young men and women has poured out of the country districts into the cities and industrial centers, in most cases never to return permanently. During the last few years especially, our industries have been stimulated to the extent of demanding many times the amount of labor they formerly used. Immigration of late has been almost a negligible quantity. The operations of Canadian agents in our northern border states seeking laborers, now happily stopped, have taken thousands of men from this country. Still more recently construction work incident to war preparation, government cantonments, munition factories, increased activities in steel mills, etc., paying exceptionally high wages, have taken thousands of others. Multitudes of Mexican laborers in the Southwest, fearing conscription, have gone back to their own country. Young farm owners, tenant farmers and farm laborers have been drafted into military service. The result is that farming operations are being curtailed and livestock is being sold off, just at a time when the Federal Department, the Colleges, State Councils of Defense and Food Administrators are advocating and begging for production which shall be larger than the country has ever known. Rural regions are always affected more severely, proportionally speaking, by military demands than are cities. Farm boys are among the first to respond to the country's call. In the present situation, not only are mere numbers being taken but those most capable of managing farms, of teaching and directing inexperienced partially non-productive laborers, and who are experienced in the operation of farm machinery, are being removed.

There is a good deal of unrest because of the feeling of uncertainty now existing. Plans for the coming year are not made as they should be. A definite and uniform policy in regard to the exemption of farm labor is lacking and we face an acute situation just as we are really beginning to enter the great war.

During the past year attempts of various kinds have been made to utilize boys, girls, women and partially non-productive labor as a relief to the existing labor shortage. No doubt 1918 will bring forth greater efforts in this direction and probably many new plans will be tried out. I have not made an exhaustive study of these efforts and shall only try to present here a few instances of what seems to be the prevailing types. These efforts temporarily to meet the shortage of farm labor seem to be shown rather typically in the following groups:

1. The organization of boys, girls, men and women into temporary camps.
2. The utilization of college students on farms.
3. The sending of semi-dependents, such as are dealt with by the Salvation Army and other like organizations, into country districts.
4. Attempts to utilize employees of stores, mills and industries and retired farmers for part or full time.
5. The transferring of colored laborers from the South to the North.

Attempts have been made in most States to furnish laborers, both male and female, singly to farmers in the usual normal way, but the greater effort this year seems to have been through the organization of various camp or groups—a colony plan usually under definite supervision and instruction. I shall try and give as fairly as I can the relative advantages and disadvantages found in these different types as I see them. The information here given has been gathered from those who were directly

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connected with these movements and I have reason to believe that it is accurate.

The Men's Camp idea is represented by the "Maryland Agricultural Army." Two companies of 50 laborers each were organized by the State Council of Defense. One company was placed at Westminster, Carroll County, and the second company at Galena, Kent County. The farmers at this latter place signed a contract agreeing to keep these men for six months. They were unable to employ them profitably for this period and the camp was moved to another section of the State, where I understand it was later abandoned on account of the overhead maintenance expenses. A business concern during the season took over the responsibility of maintaining the other camp.

The principal advantages of providing labor through this kind of a camp seem to be:

1. The camp and the military discipline seem to appeal to a class of men who would not otherwise do farm labor.
2. The farmer is relieved of the housing and caring for the men.
3. Such a camp serves as an incentive in a region for larger production.
4. The presence of the camp has a salutary effect on local labor, especially the colored population.

The disadvantages incident to organizing and operating this kind of a camp seem to be:

1. A group of 50 men is too large to handle. This amount of labor usually cannot be utilized by farmers except in rush seasons.
2. The overhead expense of maintaining such a camp is great.
3. It is hard to maintain the discipline necessary with this class of men. No one has any real authority.
4. There is no way of preventing desertion. Many laborers leave these camps.
5. Only a few among these men had had farm experience.
6. It is difficult to get "commanders" who can handle these men successfully.

In Rhode Island a "Commission on Agricultural Inquiry" together with a farm-help specialist of the United States Department of Agriculture, were successful in recruiting the ranks of farm laborers from the mills and factories.

The Salvation Army and other charitable and benevolent organizations have tried at different times to place men such as they usually come in contact with on farms, but so far as I know in a majority of cases such persons seldom stay long in the country and are not usually satisfactory to farmers while they are there.

The attempt to supply farm labor by means of boys' camps of varying types has been tried in a number of States the past season. Aside from helping out the shortage of farm labor, the time of boys, which is usually wasted during the summer or at least is unproductive, is utilized and at the same time these boys are taught things which they ought to know.

"The School Boys' League for Farm Service" in New York State represents one of these types. A "Farm Cadet Camp" was located at Farmingdale, Long Island, which is in the central part of a large pickling district. The boys were housed in tents 12 x 14 in size, eight including the squad leader to a tent. A superintendent, an assistant superintendent, a chef

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and assistant chef were provided. The camp was conducted for six weeks, the boys working six hours a day, and receiving 25 cents an hour for their labor. The boys paid into the camp $5 a week for their board and lodging. This camp supplied the labor needs of this community at that season and it is reported that the camp appealed to the boys and that the labor was satisfactory to the farmers.

New York State also operated what they called the "State Camps." These were financed by state appropriation and by funds furnished by the Food Supply Committee. If correct information has been given me, there were 19 such camps, nine at Newburgh, six on Long Island and four at Highland which were only partially connected with the official scheme. There were also three camps for girls.

The boys and girls of New York State, either in or outside of these camps, did three things:

1. They took a farm-to-farm census of the State, the school authorities being the local organizers of this movement. For this the State appropriated some $19,000.

2. Boys and girls over 16 years of age were excused from school under a special act of the Legislature to work on farms.

3. The "Cadet Camps," already spoken of, were organized to furnish farm labor.

These camps were for the most part under the direction of the Vocational Bureau of the New York State Military Training Association. They were placed in communities where the demand for boy labor would justify their presence (as determined largely by the farm bureau manager). The sites were wisely selected. Health regulations were carefully observed. The leaders were taken mostly from the teaching profession. The boys lived in tents, berryhouses, shacks and in other outbuildings. They were paid $15 per month and were given their board. Some earned as high as $2.50 a day. Information is at hand which shows that these camps were of much relief to fruit and special crop sections. Information about the cost of operation is lacking.

Maine organized under a large state appropriation "The Junior Volunteer Work" camps at Winthrop Center. The State Y. M. C. A. Camp Farm was used as a site. The camp was in operation from June 12 to October 12. From 650 to 700 boys were first given training at the camp and were then sent to different sections of the State in groups of 25 or 30 to work on farms. The boys enlisted and were paid by the State, a fact which seems to help explain the splendid spirit existing. High class leaders, receiving $100 each per month for their services, were provided. The camp was considered by the Governor a public safety measure. The farmers paid the group leader for the services of the boys at the rate of $1 and meals for each secular day. The boys received pay direct from the state treasurer by checks of the same kind and at the same rate as the national guardsmen. School credit was given for farm work.

Massachusetts had two types of camps. A state committee on "The Mobilization of School Boy Labor" was organized to supply city boys as farm laborers. Several camps of from 25 to 75 boys were placed in selected localities. Each group or camp was in charge of a responsible person, usually a local school teacher. The boys were instructed by the farmers themselves.

Boys' camps have been maintained for five years at the Massachusetts

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Agricultural College. These were enlarged and extended during the past summer to take 40 or 50 boys for a month at a time. The camps were under military discipline and the highest type of leadership and supervision obtainable was provided. Instruction was given by members of the college staff. The boys spent half of each day receiving instruction and taking recreation and the remaining half in working on the college farm or on farms and gardens in the vicinity. The boys paid $30 a month into the camp and received pay at the rate of 15 cents per hour for the labor they performed.

The "United States Boys' Working Reserve," is a very legitimate attempt on the part of the United States Bureau of Labor to organize under the State Councils of Defense, thousands of boys to help out in the farm labor shortage. This organization is active in most of the States, has the highest ideals of service, and, so far as I have been able to find out, has been successful in fulfilling its objects and purposes.

The effort to mobilize women into camps and utilize them in carrying on farming operations is typified by the experiment at Mt. Kisco and Bedford, New York. Here college girls, teachers and women from the trades and industries of New York City to the number of 70 were organized into a camp and worked on the farms and estates of the vicinity. This camp was heavily underwritten financially in the beginning. Several thousands of dollars were placed at its disposal and four automobiles were either loaned or given. A farm of 250 acres, on which was located a large house as well as outbuildings was furnished without cost. The camp was in charge of one of the leading women professors of Columbia University. The agricultural instruction was given by a young woman formerly a student at Cornell. The region around this camp was one which could furnish a large amount of light work, gardening, weeding, etc. These women also to some extent did haying and harvesting operations. The camp paid these young women $15, and in some cases as high as $24, per month for their work. It collected from the farmers at the rate of 25 cents per hour for their labor. They were transported to and from the farms on which they worked by means of the automobiles already mentioned. Universal testimony from this region is that for light labor, these women were satisfactory. They were quick to learn and did their best. The women themselves were well pleased with the experiment, they gained in weight and strength and the work was evidently fine for them.

Such a camp as this, and the others mentioned, can be operated successfully in selected localities where the sentiment is right; where there are special crops; where light seasonable labor is needed in sufficient quantity to justify these; and where the right kind of supervision and instruction can be given. To advocate these camps, excepting under the above conditions, does not seem to me to be wise or expedient.

There is the possibility too, of course, in times of great need of organizing large numbers of women now partially idle in most cities and large villages, to help out in times of rush seasonal labor.

College students have been appealed to, from patriotic motives, to leave their college courses and take up work on farms. These calls were responded to with such enthusiasm last spring that not only did our Agricultural Colleges close weeks ahead of their usual dates, but many classical institutions as well. College students who might have earned from $4 to $5 a day in other industries worked through the season on farms

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for from $30 to $45 a month. After sacrificing other positions to take up farming, many of them report a large number of loafers and idle men in the regions to which they had gone. Quite naturally their patriotic spirit has been somewhat dampened.

The breaking up of high school and college courses of study, in my judgment, has not been justified by any emergency we have as yet faced and is one of the greatest mistakes this country is making. England learned her lesson in this respect during the first year of the war, but we do not seem to profit by her mistake. It would seem that it would be possible so to reorganize our industrial life that education, at least in secondary schools, about the only thing once it is obtained that can not be taken from our young people, might go on as usual.

In agricultural regions adjacent to many of our industrial centers the method has been practiced of having the owners of the factories release a small percentage of their men who had formerly been accustomed to doing farm work. This plan seems to have worked well in most instances.

Early last spring an effort was made to bring large numbers of colored laborers from the South to the North for farm work. Virginia lost in this way about 50,000; Texas 120,000; Georgia about 50,000; and some of the other Southern States in about the same proportions. Many of these did not work on farms after they reached the North, but took up other employment at higher wages. The negro is not adapted to northern conditions. The North does not know how to handle him to advantage, nor is it desirable to bring southern negroes in large numbers into isolated rural regions. Farm wages in the North are higher than those to which he has been accustomed and this is not conducive to his prosperity. Depleting the South of its negro labor only serves to reduce its producing power and to continue this movement will be bad for both sections and it should be stopped.

Boy scout patrols have also been set to farming. Other schemes for providing farm labor from partially non-productive sources have been tried, but I am not familiar enough with these to discuss them.

It will be noticed that most of the attempts that I have mentioned center around the camp idea, an expensive and abnormal way of meeting the need. None of these camps, so far as I am aware, have remained intact throughout the autumn, and at this very time potatoes and other staple crops are remaining unharvested because there is no labor available.

The utilization of retired farmers, and those who labor little but live on their incomes, has not as yet been tried as much as it should. It will do this latter class much good to work and they as well as others should contribute what they can to help win the war. This effort would give some people in cities an appreciation, too, of some of the difficulties which farmers face.

Farmers themselves, by better management, by providing better equipment and in other ways, can make their own labor produce more.

As was stated by President Creelman (page 147), Canada has already contributed more than five percent of her population to war service. We so far have contributed only a little over one percent. Yet she is increasing her production constantly and we are already talking about decreased production next year. Stopping non-essential industries, thus releasing much labor to be used in other productive lines, should be done at once.

The situation in which we find ourselves regarding crop and animal

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production, and the limitations surrounding these due to the shortage of labor, raises rather large and interesting questions, some of which I venture to offer for discussion at this time.

1. Can we expect that the camp idea and the utilization of irresponsible, inexperienced labor will ever really solve the farm labor problem?

2. Does not the present situation arise out of unbalanced economic and industrial conditions and must not these be corrected at the root before we can look for much real relief in the farm labor situation?

3. Must we not shorten the hours required of farm laborers and raise their wages before good labor will be attracted?

4. Is it desirable for organized labor to take a hand in the farm labor situation?

5. May we expect relief in the farm labor situation from immigration after the war ceases?

6. Should not a national policy regarding the value of the farm laborer, to a successful prosecution of the war, be set forth at once?

7. Shall we in a wholesale manner encourage women to work in the fields of this country? (Foreign women do not do it for many years after they come to us.) What would be the effect of this on the kind of American home life which we are trying to develop?

8. In order to encourage agricultural students to continue in their college courses, should they not be placed in the same class with students of medicine or dentistry, so far as conscription is concerned?

9. Would the teaching of the practice, if not the science, of agriculture in our public schools give us a supply of people able to do farm work? The effect of the Smith-Hughes Act on this can not as yet be realized.

10. The country says that men shall fight. Why not enlist them for farm work, the construction of railroads, for ship building, munition factories, etc.? There seems to be great opposition to the industrial army idea at present.

With America and the Allies facing the present serious situation, there will probably be a greater shortage of farm labor next year than ever before. All such efforts as have been made this year and the experiments which have been tried have proved of some value. Farmers must make up their minds to use inexperienced labor and to teach these persons how to do the work themselves. The United States Department of Agriculture hopes to place a "Farm Help Agent" in every State that desires such an officer, with district organizers for groups of States to assist state agencies to handle the farm labor problem. Each State should carefully estimate the number of men it needs on its farms and in its factories and industries. Some sort of adjustment and balance between these must be maintained if possible. We can not hope to cope at all adequately with the situation unless there is perfect cooperation and coordination of effort between the Departments of Agriculture, War and Labor, in Washington, the State Councils of Defense, Food Supply Committees, the state extension systems and labor agencies and unless all of these, and the public generally, fully realize and are willing to act on the proposition that the food absolutely needed to make us successful in this war can not be produced unless farm labor is supplied.

THE CHAIRMAN. The next question is one which is of great interest to many of our extension directors, one which is of growing importance, namely, "The Relationship of Agricultural Extension Work to Farmers'

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Cooperative Buying and Selling Organizations." Mr. Bradford Knapp of the States Relations Service of the Federal Department of Agriculture, will open the discussion of this topic.

The Relationship of Agricultural Extension Work to Farmers' Cooperative Buying and Selling Organizations

By Bradford Knapp

I am somewhat embarrassed in opening this topic because of conditions presented at the present time. I realize, as you do, that we cannot now afford to set hard and fast rules. If a particular job had to be done in order to further the great interests of this Nation in its present crisis, we may have to set aside rules for the moment and return to them when the war is over.

Nevertheless, I feel that there are certain fundamental principles involved in the relationship between extension activities and farmers' cooperative marketing and buying organizations which should not be forgotten even in time of war. It may be that I have misstated the particular subject that we are to discuss here, because my understanding was unlike the program statement. I shall discuss the relationship between the extension "worker" and farmers' cooperative buying and selling organizations. Essentially there is no difference in the subject or its discussion, for after all what we are after is the relationship between the individual extension worker and these organizations. Now, our answer depends entirely upon our conception of what the extension worker is for—what is his function—what is he trying to do.

I think I said a year ago during a discussion of some subject in our extension section, that if you regard the extension worker, especially the county agent, as a mere public service man or woman put into the field to render personal service and have solely that conception of the work, you will establish one rule of action, whereas if you regard the extension worker mainly as a leader and a teacher put into the field for the purpose of getting others to do things, then you will follow an entirely different rule in this relationship. I believe that this particular problem of the marketing of farm products and the purchasing of farm supplies is the hardest nut the extension worker has to crack. The principles involved are easy of application in the vast field of extension work but difficult of application in this particular type of extension work.

We have heard a good deal during these meetings regarding the qualifications of teachers, especially qualifications of teachers under the Smith-Hughes Act. I want to say that the county agent must possess all of the qualifications you have heard spoken of in these meetings regarding these teachers, and besides that he must be an exceedingly tactful and level-headed business man and a leader. If he has the proper qualities of leadership, capacity for organization, and understands the purposes of his work, to my mind there is little chance of his going wrong in what he does. But a county agent is almost invariably enlisted without a great deal of training for his work, except his training in practical and scientific agriculture, and is put off somewhat by himself to work out his destiny in a county. Therefore, we have not been surprised when county agents and other extension workers have made mistakes regarding their relationship to farmers' cooperative organizations.

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The county agent or other extension worker must remember that his work will be effective in direct proportion as he gets other people to do things and it will be unsuccessful in proportion as he assumes responsibilities himself which might be undertaken by other persons under his leadership. He is a leader and teacher, an inspirer of activities upon the part of the people. He must lead them, educate them, teach them and train them to do things for themselves. One of the best of our southern state leaders says that "The county agent's job is to work himself out of a job."

I do not believe that the Government, either Federal or State, has any business in ordinary times to assume the duty of transacting the private business of any farmer or any group of farmers. I do believe that the Federal and State Governments have certain responsibilities regarding the problem of marketing and distribution of farm products and the purchase of farm supplies. They may well furnish a market news service, make suggestions regarding methods of organization and the like. It is appropriate for them to establish grades and standards and to exercise other regulatory functions. The Bureau of Markets and State Marketing Associations investigate markets, types of organizations, methods of transacting business, and may even furnish plans and specifications or advise as to the constitution and by-laws of an organization, its methods of procedure, etc. This is all very well; but they have no right to pay the salary of a man who acts as the mere business manager of the organization after it is perfected.

Let me relate a few personal experiences which I have gathered out of eight years or more of experience, which may show how easy it is for a county agent to take the wrong path. As he travels among his people it is a very easy thing for him, out of the kindness of his heart, to be led to do things for people which he ought to persuade them they should do for themselves; and therein is the great opportunity of the county agent. If he has got the leadership and ability to get other people to do things, he becomes a great constructive power in his county; if he has not the ability to get them to do things or if he is weak enough to let them unload the burden on him, he will soon find himself in very great difficulty.

I remember an instance where, some years ago, a county agent got into trouble. A certain type of fertilizer which the farmers greatly needed was selling at a very high price, at retail and on credit. It was impossible to purchase it except through certain business channels. The county agent thought it was good business for the farmers to purchase cooperatively and for cash, that it would tend to upbuild the agriculture of that region. He wrote to various manufacturers and asked for prices, saying that he had a body of farmers who wanted to purchase in carload lots; and when the selling agents of the fertilizer concerns came into the county to cut straight across its established business methods, they came to the county agent to make the deal. He made the deal. The result was that he had practically every business man in the county against him. The County Board of Supervisors, influenced by the business men, commenced to withdraw financial support derived from the county treasury. The result was disastrous. That agent lost out. He tried to do the right thing in the wrong way. It would have been perfectly easy, as I see it, for him to have persuaded these farmers, who were already organized into a farmers' organization, to take up that business themselves, to write the letters themselves, to deal with the agents who came to perfect the deal, and to have

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kept himself clearly in the position of a teacher, a man who is trying to influence others to do things for themselves. Under a new agent this matter has been adjusted and the farmers buy their fertilizers cooperatively.

No longer ago than last week an excellent county agent made what seemed to me to be a very slight mistake which illustrates what I am trying to talk about. Although in the main doing admirably, in one particular he failed; and immediately there came a complaint to the Food Administration and thence to the Department of Agriculture, charging him almost with transgression of the law. It was claimed that the county agent happened into the office of a mill man in his county and asked the simple question: "Will you pay an increased price for cottonseed if the farmers of this county will assemble the seed and sell you a thousand tons in one deal, thus obviating the necessity of your picking it up in small lots from this, that and the other man?" The answer took the form of a charge that he was trying to instigate farmers to raise the price of cottonseed. If the organized farmers of the county had been advised by him to send a representative to the mill man and say:—"We can save you the labor and expense and other things incident to the collection of the cottonseed of a large section of this county. If we do this you can afford to pay us a better price. We are trying to serve you." Had he proceeded in this fashion I believe he would have accomplished his end without criticism.

I know of hundreds of cases where county agents have been asked by individual farmers or communities of farmers to buy this, that or the other thing for them and they have acquiesced. But every time that the extension worker performs for farmers a service which is a purely business service, he is doing wrong, unless—and this is the only exception—he is doing it under circumstances which require him to do something as a demonstration to them of how it can be done. I can conceive such a case; but in that case he should make it perfectly clear to the farmers that he is doing it for that sole purpose, and say to them: "You must learn how to do this so that you can do it when I am not here. You must yourselves assume the personal responsibility in such matters." I think this general principle runs throughout all extension work. If it is vaccinating hogs for cholera or other lines of service, the extension worker cannot go wrong if he keeps constantly before his mind the fact that his job is so to organize the county that others will transact the private business, that others will take up new duties and will straighten out the business lines. He is a helper, a guide, a counselor.

The principles I have laid down apply equally where there is a strong county organization such as a farm bureau, or where there is an existing farmers' organization such as the Farmers' Union, which are very numerous in the South, the Grange, or any farmers' organization organized for a definite purpose, such as farmers' cooperative selling organizations, cooperative elevators, cooperative creameries, cooperative cheese factories, cooperative fruit selling organizations, etc.

The county agent should be understood to be, therefore, a public officer having to do with instruction, leadership and, possibly, with the perfecting of organizations. He shall ardently and fearlessly advocate the formation of cooperative enterprises in the interest of a more efficient agriculture. I believe in county agents helping organizations and influencing people to organize for business purposes, to teach and train them in their work, always keeping before his own mind and the minds of the people with whom he deals that he has a definite object in view, namely,

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to get them to do something for their own good and not to do something himself. If we keep that in mind, then I feel sure that the relationship which exists between the extension workers on the one hand, and the farmers' cooperative buying and selling organizations on the other, will be a thoroughly satisfactory one.

THE CHAIRMAN. The discussion will be continued by Director A. D. Wilson of the University of Minnesota.

A. D. WILSON of Minnesota. Every one of us who has had experience believes absolutely in the general wisdom of the policy laid down by the last speaker. There are, of course, different angles from which one may look at the situation; and even though one follows the policy just outlined, he will occasionally get into trouble, and then, of course, the question must be settled in his own mind as to what his attitude really ought to be. I like to quote from our good Irish friend, Sir Horace Plunkett, who says that, "public institutions cannot successfully undertake the encouragement of cooperative enterprises, and that if they do they are sure to have their appropriations reduced or at least strenuously opposed by representatives of business interests affected by the cooperative enterprises encouraged."

There are many cooperative organizations in Minnesota. They have been in existence for many years. For us to ignore so important a factor would be little short of suicidal. We should fail to assist in a matter that really calls for the earnest help of unbiased men who can see both sides of a question that interests every individual in a community. We recognized that for a public institution to take an active part in cooperation would raise opposition both from farmers and from business interests; and our expectations have been realized. The more radical farmers have felt that we were not active enough in bringing about a reorganization of the machinery of distribution, and have freely accused us of being in league with the big interests. The less progressive business men have felt that we were too active in encouraging cooperative movements. For example, one of our communities became interested in organizing, some years ago, a livestock shipping association. They decided soon after organization that they needed a carload of feed, and, being a little indiscreet, as newly organized associations are apt to be, they did not consult their local feed dealers. Of course, we always advise dealing with local people whenever possible; but they did not do it. They secured prices from outside parties and then went to the local miller and said, "We will give you so much for a carload of feed." The farmer complains because he has no opportunity to fix the price on his sales products and these farmers got back at this particular dealer by not allowing him to fix the price on what he had to sell, offering him just what they could get the product for elsewhere. Some time later this dealer, meeting me, vigorously protested, but I did not sympathize very much with him; in fact, I rather enjoyed the situation, because it illustrated the fact that whether the farmer or miller is concerned, human nature is much the same. It seemed to me that while it was a bit wrong for these farmers to go past the local man, in doing so they put him in exactly their own position when they drive up to an elevator with wheat or to town with a load of produce, and are told, "The price is so and so." We have felt that a public institution, unbiased in its judgment and disinterested, could furnish more reliable and constructive information and assistance than could be supplied from any other source.

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With this view in mind, we have taken an active part in organizing and helping all sorts of farmers' organizations, and we feel that we have been able through this line of work to be of real service to them. Our former dean, Dr. A. F. Woods, when asked, "Does the department of agriculture of the University encourage organization among farmers?" answered, "Yes; because organization is as necessary for farmers as it is for merchants, bankers or any other class of business men."

Secretary Houston, in a letter recently written to some one who was criticizing the activity of the Federal Department along this line, wrote as follows:

"It is a legitimate and proper part of the work of this Department, in fact it is its duty, to furnish farmers with information which will enable them to develop greater efficiency in all respects, including the securing of their supplies and the marketing of their products."

We have accepted that as the only logical thing to do. We have not tried to organize or manage farmers' cooperative enterprises, but have fearlessly helped the people of any community when they have come to us for information. We have told them exactly what we knew about the type of organization desired, the difficulties that they were likely to run up against and the possible advantages. A simple slogan that we have concocted has been of help to us in deciding whether or not we wanted to advocate a certain cooperative enterprise. "We believe in cooperation for efficiency and not for sentiment nor for war." We believe in helping to organize a cooperative institution in a community when we know that it will enable the community to do something that must be done there more efficiently than it has been done before. We are not interested in cooperative enterprises that are built upon nothing more substantial than an enthusiastic belief that cooperation will do everything in the community, that the sun will shine brighter and the birds sing more sweetly as a result. That is organization based on sentiment and enthusiasm, it dies out, and you have nothing left. There is a type of organizer that uses that kind of argument. On the other hand, there is a type of organizer who says that everybody is against the farmer and the only possible chance for him to get anywhere is for him to organize and use his might to overcome the other fellow. That is the organization for war and gets nowhere. You get over being mad after awhile and the organization dies out. But if you realize that it is a serious business, and that it requires persistent effort year after year, and if it built to do something better than it has been believed possible to do it, better than any one has been able to do it, you have a permanent machine in the community, you have something that will last because it performs a service. We look on cooperation as upon any other machine that the farmer uses. I often express it this way, that we all know that a potato digger is a mighty good thing to dig potatoes with, but it is not worth anything to cut corn. Now, a cooperative organization may be a perfectly good thing, but there may be no use for it in the community.

We have 700 cooperative creameries in Minnesota, and we know, absolutely, that they are good institutions. Our poorest cooperative creameries pay just the same as do the best centralizers for butter fat, and our good ones return from eight to twelve cents more; but I have seen hundreds of these cooperative creameries placed in communities where they were not needed, and of course they have failed. You must avoid placing a machine in a spot where it is not needed. The matter calls for much

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careful consideration. You must consider the interests of the people in the community who are handling the thing at present and see whether or not it really is better for the whole community to do it another way.

Our livestock shipping associations are admirable institutions. They are growing in numbers and doing good work. We do not hesitate to recommend their organization wherever there is any reasonable amount of stock to market; but we do not assume that the local buyer has been a thief and a robber, and organize the association in order to get even with him, but because we believe that the shipping association is a better machine than he is. Let us discharge the cradler and employ the reaper, the self-binder, to do the job; in that way you do not incur antagonisms. Very often the old local buyer is employed as the manager of the local shipping association. I often illustrate this matter in this way. Here is a fellow that has lived out from town in a direct line, we will say, three miles. There is a river between him and the town, and because there has been no bridge on the direct line from his place to town he has had to go up two miles to get to a bridge and then come down two miles. In other words, he has had to travel six or seven miles to market instead of three miles. After a while he and his neighbors are able to build a bridge across the river which enable them to go straight to town. He does not need to blow up the old bridge over which he has had to travel seven or eight miles to get to town in order to build the new one. The old bridge has served its purpose, it has been a useful thing, but he has outgrown it and he now has a better way of getting to town. The shipping association is the new bridge; the old local buyer the old one.

On the other hand, a type of organization that one must look into very carefully, and one that often goes wrong, is the cooperative store. We have many cooperative stores, but not half as many as have been organized. That is the experience throughout the country. Now the shipping association actually gets stock to market on a shorter line than the local buyer. The farmer gets more protection from it. He does not have as many items of expense as the local buyer naturally must have in handling the same business. On the other hand, the cooperative store does business in the same way as other stores; it must have a store and clerks and the same overhead expenses. Consequently there are just two chances for a cooperative store to succeed as compared with a private store; it must have a better manager or one that is more honest. Now, the regular storekeeper is usually honest. He has just as good a machine as the cooperative store has, and the chances are that the farmers' machine will have a hard time to get under way. On the other hand the type of cooperation that builds a better machine, that eliminates some of the steps that have been taken, is likely to succeed, has succeeded and is succeeding all over the country. Extension directors and workers must face this question fairly and squarely. It cannot be dodged. To attempt to sidestep it is to invite trouble. The only way of meeting it successfully is for each director to work out his own idea of what is right, what is best, which is the better machine, what is advisable and what inadvisable, and to advise his people accordingly. On such a basis, barring minor difficulties, he can handle this question of cooperation in buying and selling just as well as he can the question of producing hogs or cattle.

THE CHAIRMAN. All extension services must deal with the problem of distributing agricultural information. In some of our States, moving pic-

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tures have been used to this end. Kansas has done as much work along that lines as any other State. Director E. C. Johnson of the Kansas Agricultural College will discuss "The Moving Picture as a Means of Distributing Agricultural Information."

The Moving Picture as a Means of Distributing Agricultural Information

By E. C. Johnson

That there is much interest in the moving picture as a means of distributing agricultural information is clearly evidenced by the fact that this subject was given a place on this program. It is evidenced also by the fact that 29 extension directors out of 48 replied inside of a week's time to a questionnaire relative to the use of the moving picture in extension work and that 11 of these already had used moving pictures in their work, 11 were planning to do so, six answered without further comment that they had not used these pictures and one said he had not gone into the business because of the expensive equipment required and the difficulty of transporting it from place to place. Furthermore, he was of the opinion that it is not yet practical to present moving pictures with other than electric lights and that extension meetings should be pushed into the country to meet the farmers rather than held in the city and the farmers brought to town.

When we consider that the moving picture has been used only during the last 25 years, that its popularity is based principally on its effectiveness in the realm of comedy and dramatic presentation and that its use for advertising and educational purposes is recent, this interest in and use of the moving picture by extension agencies is but another demonstration of the progressive spirit of the agricultural colleges in their extension work.

The use of moving pictures in extension work is yet in the pioneer stage and the number of films which are serviceable from the standpoint of agricultural information is small. Only a few subjects easily susceptible of demonstration have been filmed, such as poultry houses and breeds of poultry, cholera infected hogs, disinfection methods, sprayers at work, gardening and canning demonstrations, methods in wheat production, and such boys' and girls' activities as the feeding and growing of a pig or the tending of a garden. In some cases ordinary farm operations have been filmed which are of no special interest or educational value to a farmer spectator except from the standpoint of the novelty of seeing operations with which he is thoroughly familiar thus represented and seeing himself as others see him. Such plan may be of much value, however, in teaching something about agriculture in city schools. Few educational films really worth while as a means of imparting information touching agricultural operation have been developed by commercial agencies. They do not fully understand as yet that an agricultural film to be of use must be prepared with the most careful attention to details, that the farmer is quite as quick to notice the amateur on the farm as is the city man to notice the amateur in the city. I have in mind, for instance, a film which perhaps many of you have seen, in which so many farm operations are done in a way that farmers do not do them that the whole film is made ridiculous to a farmer audience.

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The best agricultural films are those prepared under direct agricultural college supervision with farming people as actors, whose reaction to all farm activities is standard from force of habit. The professional actor is not successful in an agricultural educational film. He fails in the detail of the simplest farm processes. Those who have observed the professional wielding the fork in pitching hay, handling bundles or spreading bedding, know what I mean. They do not "perform" as the man born and brought up in the role. Therefore, the outstanding necessity in the preparation of such films is to find suitable actors. This is more easily done, perhaps, than most people imagine. Those not intimately acquainted in farm communities often are astonished by the dramatic ability found there. It is safe to say that such ability is latent in every community and needs only a stimulus to bring it out. Moreover, the farming people enjoy acting for a "movie" even though it takes much of their time and much hard work. I have never seen greater enthusiasm for any kind of entertainment or dramatic work than was evidenced by the people of the Glenwood community in Kansas when the activities of the Glenwood Mother-Daughter Canning Club were "filmed." Not only did this film bring out a number of good actors, but the people of the community made many sacrifices in order that they might devote their time and energy to its production.

One of the chief difficulties in preparing an agricultural film is that it cannot be done in a day or in a few days. It often happens that time for natural growth and development of livestock or crops or for change of scene and seasons must intervene and the film must be prepared piecemeal. This makes the undertaking an expensive one if the film is prepared by a commercial photographer. Of two films made by the Kansas State Agricultural College, "The Glenwood Mother-Daughter Canning Club" and "Winning with Wheat"—the first was prepared by a photographer closely associated with the college work and the negative and first copy cost 90 cents a foot, while the second was prepared by a commercial photographer and its cost exceeded 50 cents a foot for the negative and first copy. The high cost of the second film was due to the fact that the work had to be rushed irrespective of cost and the resulting expense was higher than where an official photographer gives the work an hour's time or more as needed and as conditions favor.

The lack of technical knowledge as to the way in which properly to present the subjects by means of pictures presents difficulties. While the pictures may be very clear to those intimately acquainted with the subject-matter, they lack in clearness to the general observer, to whom it is necessary to present every detail of a story either in legend or in picture. This technique cannot be acquired except through experience. If, therefore, we are to have successful moving pictures of agricultural subjects, it is absolutely necessary for the agricultural colleges producing these pictures to employ official photographers, who have some knowledge of agriculture and who may study the best methods of presentation, thus developing a special technique in this work. Unless such crudities as are found in every agricultural film that I have seen can be eliminated, these films will not be successful in the long run, as they lag far behind the commercial dramatic films in technique of presentation.

After a good film has once been secured, there is little difficulty in arranging with moving picture houses for showing it, either in connection

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with their regular photoplays or independently. The majority of movie house managers are willing and glad to cooperate in this educational work free of charge. On the other hand, it is not an easy matter to present it effectively in communities where no electricity is available. Only four colleges (Georgia, Louisiana, Ohio and Kansas) report having tried to show moving pictures in communities without electricity. The Georgia extension service owns a truck loaded with a gasoline engine, dynamo and a moving picture apparatus, and this outfit is kept busy in the rural districts. The Louisiana institution owns an automobile which is similarly equipped. The Ohio extension service has used with good results a motor truck equipped with moving picture machine and a home electric light outfit. The Kansas extension service has used a truck equipped with a moving picture machine and a home-light plant with good results. This equipment is especially useful in communities far from the railroad where "movie" houses are uncommon. The Kansas College, also, has used the oxygen-ether light generated in gas making outfits such as can be secured from any picture supply house. This has proved unsatisfactory, being heavy and hard to transport. Furthermore, no matter how expert the manipulator, the results secured from such light are not comparable to those attained with electricity in the commercial moving picture houses. Storage batteries may be used for lighting purposes, but they are heavy and must be recharged at frequent intervals. It remains, therefore, for the future to develop a satisfactory and portable moving picture outfit which may be used in communities where electricity is not available. Every one, I believe, who has had experience with moving pictures in the country will render the same verdict.

There is a wide difference of opinion as to the interest of the spectators in agricultural films. Eight extension directors reported on this matter, five stating that the interest is good or excellent, one that unless the films are as good as those usually shown by motion picture companies they are severely criticized, and one that such films cannot compete with Fatty Arbuckle or Charlie Chaplin.

My own experience has been that the interest in the films prepared under the direction of the college is exceptionally good. However, the interest of the general public in educational films is less pronounced than in comic or melodramatic portrayal. This fact is well illustrated by a cartoon which recently appeared in a Kansas City paper. On one side of the street a moving picture theater displayed a big sign reading, "Educational Afternoon, Free to Children," and no one was entering, whereas, crowds were thronging the doors of the ordinary show house across the way placarded with posters representing comedy and tragedy and with the sign "Admission Ten Cents." This cartoon shows the results of an experiment put on in that city in which certain moving picture houses undertook to do their part in featuring educational films. The comparison is also illustrated by the fact that when educational films are presented the people frequently laugh at actions that are not intended to be comic, thus showing that in looking at pictures the people who are accustomed to them are constantly looking for something to appeal to the emotions and to make them either laugh or cry. The emotional expressions coming without sufficient provocation when an educational film is shown tend to make the educational presentation ludicrous. Whenever the moving picture is used in agricultural education, therefore, there must be sound reason for presenting the subject with the moving picture rather than by other means.

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The pictures should deal only of subjects in which action is necessary to a satisfactory presentation, of subjects the developing of which extends over a period of time and which cannot be shown effectively in a single demonstration meeting, or of some event which is interesting from a historical or community standpoint and cannot be reproduced easily.

The educational value of films as compared with the more common demonstration lectures and field demonstrations is a much mooted question. Nine extension directors replied to the questionnaire as to the educational value of the films, three considering that it is very high, one that a good set of slides gives more satisfaction to an audience, one that films are merely an entertaining feature, one that the educational value of a good demonstration is much superior to that of a film, while two question whether the game is worth the candle, whether the educational part warrants the necessary investment. Psychology teaches us that suggestions received through the ear and eye at the same time make a deeper impression than if received through one sense only. Therefore, a moving picture accompanied by a descriptive lecture should make as deep an impression, if not a deeper one, than a demonstration or a lecture.

While the films have been used to some extent in extension work by 11 of the 29 services reporting and 11 more are planning to use them, there still is doubt in the minds of many extension directors as to their value in the agricultural extension work as now organized and conducted. It is not felt that these films will supplant the illustrated lectures or demonstrations because many points in which farmers are interested and concerning which they wish to ask questions are brought out in lectures or demonstrations, whereas when a film is run the questions that come to the mind cannot be asked and by the time the presentation is over are forgotten. Moreover, a certain degree of confidence must be established before the farmers will ask questions and this is not easily obtained in the time that it takes to run a film.

Where a quick campaign is desired, such, for instance, as the wheat production campaign conducted in Kansas by the Agricultural College and the State Council of Defense during the summer of 1917, undoubtedly the film can be of very great use, as it is possible to reach many in this way who are not attracted by the illustrated lecture or the demonstration meeting. In this campaign, the film was shown in 92 places during three weeks in late July and early August, a time when the farmer is exceedingly busy. In spite of the busy season, the total attendance aggregated 23,275 and at least 50 percent of those present were farmers, the others being children and townspeople. These farmers would not have come to a demonstration lecture in their neighborhood at that time, while they did come to a moving picture presentation. A trained crops man accompanied the reel so that the questions that were asked could be answered authoritatively.

From this study of the moving picture as a means of distributing agricultural information and from the experience which we have had in Kansas, I have come to the conclusion that the presentation of agricultural information through moving pictures is still in the same pioneer stages that the moving picture industry was in 10 years ago; that the interest in educational pictures will increase; that the technique of producing these pictures will be developed rapidly only when agricultural colleges employ official photographers who will give the subject special attention; that the

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acting must be by farm men and women who instinctively perform farm operations in the orthodox manner; that the pictures cannot be shown satisfactorily where electricity is not available; that the agricultural pictures should be of as high a grade in technique of performance as those ordinarily seen in the best moving picture houses; that only those subjects should be filmed where action is necessary to a clear presentation; and that the audience should not be secured under the pretense that pictures will be shown for entertainment but that the pictures are shown only on account of their educational value.

On motion, the section adjourned *sine die*.

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Proceedings of a Special Convention of the Association of American Agricultural Colleges and Experiment Stations

Washington, D. C., January 12, 1918

Pursuant to a call issued by the Executive Committee, in accordance with paragraph 1 of the section of the Constitution dealing with "meetings," a special emergent convention of the Association was held at the Cosmos Club, Washington, D. C., on January 12, 1918, Vice-President R. W. Thatcher of Minnesota, presiding. There were present as delegates: Alabama, C. C. Thach; Connecticut, C. L. Beach; Georgia, A. M. Soule; Iowa, R. A. Pearson; Maine, R. J. Aley; Maryland, A. F. Woods; Massachusetts, K. L. Butterfield; Mississippi, W. H. Smith; Minnesota, R. W. Thatcher; Missouri, A. R. Hill; Nebraska, Samuel Avery; Nevada, J. G. Scrugham; North Carolina, C. B. Williams; Ohio, E. F. Coddington; Pennsylvania, R. L. Watts; Rhode Island, Howard Edwards; South Carolina, W. M. Riggs; Tennessee, C. E. Ferris; Texas, ——— Bolton; Vermont, J. L. Hills; Virginia, L. S. Randolph; West Virginia, F. D. Trotter; Wisconsin, H. L. Russell.

President R. A. Pearson, acting chairman of the Executive Committee, stated that the meeting had been called to discuss certain topics, namely:

1. The deferred classification of the instructional, research and extension staffs.
2. The deferred classification of agricultural students.
3. The engineering experiment station bill.
4. A request from the Federal Board of Farm Organizations.
5. The proposition advanced at the conference held on January 11 between the Federal Board of Vocational Education and representatives of the technical colleges of the country, with reference to the training of large numbers of conscripted and enlisted men along technical and mechanical lines in such colleges during the coming summer months.

1. He set forth the status of the matter as it then obtained; read from the circular letter of the chairman of the Executive Committee; indicated that the Secretary of War and the Provost-Marshal-General had been approached; stated that the solicitor of the Federal Department of Agriculture was preparing a brief at the request of the Secretary of Agriculture, setting forth the relationship of the college agricultural staffs to the maintenance of the national establishment in the present juncture; and said that no suggestion as to blanket request for exemption or deferred classification was being made.

2. He stated that the Executive Committee wished to discover the feeling of the college executives as to the desirability of attempting to secure a status for advanced agricultural students similar to that accorded to students of engineering and veterinary science.

3. He stated that the death of Senator Newlands had introduced complications in the matter of the engineering experiment station bill and that the shape the bill should take, as well as the identity of its new sponser, should be considered.

5. He stated that in his judgment the Land-Grant Colleges could perform a notable service in connection with the training of conscripted and enlisted men, as suggested by the Federal Board of Vocational Education.

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1 AND 2. CLASSIFICATION OF AGRICULTURAL STAFFS AND STUDENTS

The matter was discussed at length by Presidents Aley, Avery, Butterfield, Edwards, Hill, Riggs, Thach and Woods, and Deans Coddington, Hills, Russell, Thatcher and Watts. Towards the end of the discussion, the acting chairman of the Executive Committee summed up the situation as follows:

The two points which seem to have been clearly developed in the discussion thus far may be stated as follows:

1. That it should be brought to the attention of the District Boards that the work of the college staffs and of the agricultural students is vital to the maintenance of the national welfare; and

2. That it might be a desirable procedure to enlist these men in a reserve corps and to furlough them without pay for such period as they remain engaged in their present lines of agricultural production work.

The discussion finally eventuated in the following action:

(a) *Voted:* That a committee of five be appointed to confer with the Secretary of Agriculture and the Provost-Marshal-General in the interests of the deferred classification of the instructional, research and extension staffs and of the agricultural students.

This committee, appointed by the Chair, consisting of Presidents A. R. Hill of Missouri (Chairman), C. C. Thach of Alabama, K. L. Butterfield of Massachusetts, W. M. Riggs of South Carolina and Dean H. L. Russell of Wisconsin, later, reported concerning the conference with the Secretary of Agriculture that the Secretary had stated that he was heartily in sympathy with the proposition to secure deferred classification for portions of the agricultural staffs; that he had presented as strong a statement as he could prepare touching this matter; and that he had urged the Secretary of War to act upon it as soon as practicable in order to clear up a doubtful situation.

(b) *Voted:* That the Executive Committee be requested to send to each college executive a statement as to the salient results of the conference to be held with the Provost-Marshal-General.

[The telegram of the Provost-Marshal-General to all Governors and transmitted by them to all district boards, being No. A 3059, reading as shown below, and transmitted by the Executive Committee to the several college executives, indicates clearly what was the "salient result" of the activities of the Secretary of Agriculture and of the committee in so far as it relates to the deferred classification of the agricultural staff.

"WASHINGTON, D. C., January 16, 1918.

Local and District Boards are authorized to classify in Division "1," Class Three, any necessary highly specialized agricultural expert employed by a State Agricultural College, established under Federal law and regularly receiving Federal funds, who is found to be necessary to agriculture as an industry and necessary to the adequate and effective operation of the service in which he is engaged and who cannot be replaced without substantial material loss and detriment to the adequate and effective operation thereof. The Board shall proceed to the consideration of a claim for such classification in respect of any registrant only when made in the usual manner and supported by an affidavit of the president or other executive head of the Agricultural College by which he is employed, setting forth his duties and particular service and stating that such registrant is necessary to the adequate and effective operation of the service in which he is engaged and cannot be replaced by another person without substantial material loss and detriment to the adequate and effective operation thereof.

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Any registrant when so classified shall stand in all respects under the regulations as other registrants classified in such division and class.

CROWDER."]

(c) *Voted:* That it is the sense of this meeting that in the interests of increased production along agricultural lines it were well to make an arrangement touching agricultural students similar to that secured in regard to engineering students.

[The telegram of the Provost-Marshal-General to all Governors and transmitted by them to all district boards, being No. B 41, reading as shown below, indicates the outcome insofar as it relates to the deferred classification of agricultural students.

"WASHINGTON, D. C., March 6, 1918.

Please notify all local boards of the following amendments to section 151, Selective-Service Regulations. A subparagraph is added to paragraph (e), as follows:

'Under such regulations as the Quartermaster-General may prescribe, students pursuing a course of agriculture, in the senior year, in land-grant agricultural colleges, whose class standing places them in the upper third of the senior class as determined by the school authorities, may enlist in the Enlisted Reserve Corps of the Quartermaster's Department, and thereafter, upon presentation by the registrant to his local board of a certificate of such enlistment, such certificate shall be filed with the Questionnaire and the registrant shall be placed in class 5 on the ground that he is in the military service of the United States.'

After the words 'Enlisted Reserve Corps of the Medical Department,' in line 2 of paragraph (f), add the words 'Enlisted Reserve Corps of the Quartermaster's Department.'

CROWDER."]

3. ENGINEERING EXPERIMENT STATION BILL

This matter was discussed at length by Presidents Aley, Edwards, Pearson, Riggs and Soule, and Deans Ferris, Hills, Scrugham and Thatcher.

The secretary of the Association read the draft of the proposed bill as drawn up at the close of the last convention (see page 234) and modified by action of the Executive Committee at its meeting held in Washington, December 14 and 15, as provided by the action of the Convention (see page 173). Its essential features were as follows:

Section 1. Provision for the establishment of an engineering experiment station in connection with each Land-Grant College.

Section 2. Definition of its duties.

Section 3. Provision for issuance and distribution of publications.

Section 4. Appropriation of $10,000 for the first fiscal year following the passage of the act, $12,500 for the second year and $15,000 a year for the third and each successive year, the State to accept the provisions of the act, provided that "no payments (be made) unless an equal sum has been appropriated for that year by the legislature * * * or furnished by state, county, college, local authority or individual appropriation from within the state for engineering and industrial research"; provided that the federal appropriation "shall be expended only under the direction of" the Land-Grant College; provided, further, that "the sum appropriated by each State or provided by any other agency within the State, other than the college receiving the federal appropriation, shall be expended by such state educational institution as the legislature of each State may designate."

Section 5. Perfunctory.

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Section 6. The Secretary of Commerce to furnish forms, indicate important lines of inquiry, furnish advice and assistance. The stations to report annually before February 1.

Section 7. Appropriation of $25,000 annually to the Secretary of Commerce in order to defray expenses incurred and to extend facilities of the Bureau of Standards to the several stations.

Section 8. Each station made a depository of the Bureau of Standards and required to conform in its work to bureau standards. The Bureau authorized to work through the stations, when desired, defraying all expenses.

Sections 9, 10. Perfunctory.

President A. M. Soule of Georgia stated that at the request of the Executive Committee he had had an interview with Senator Smith, who had expressed interest in the bill and a willingness actively to support it provided no state offsetting funds were necessitated and the full sum of $30,000 was appropriated by the Federal Government, the division of the funds to be left on a 50-50 basis to the state legislature, $15,000 to go to the Land-Grant College and $15,000 to such institution as the legislature may designate.

President W. M. Riggs of South Carolina stated that Congressman Lever evinced some interest in the measure and thought that in its present form it stood a better chance of passage than in its original shape.

The acting chairman of the Executive Committee pointed out that Senator Smith's proposal was inadmissable; that its acceptance would imperil a vital principle, namely, that of appropriating federal funds designed for college instruction, research or extension solely to those institutions erected on the Morrill Act of 1862; that it was not simply a matter of a $15,000 annual appropriation but of breaking down an established system and of creating a dangerous precedent; that once the precedent was established, assaults might be expected against the federal funds now appropriated to the Land-Grant Colleges; and that the Association should think long and carefully before it committed itself to such a proposition.

President Soule stated that the acceptance of such a suggestion and its enactment into law would place the Land-Grant Colleges in such a position that whenever hereafter federal appropriations were proposed, *quid pro quos* would have to be furnished to other institutions. He further stated that he was not at all sure but that Senator Smith would consider a bill which would appropriate directly and solely to the Land-Grant Colleges, a Committee set forth to him the dangers inherent in his suggestion. He further stated that an Act based on the 50-50 principle would precipitate biennial fights in many, perhaps every, state legislature.

Dean C. E. Ferris of Tennessee preferred no legislation whatsoever rather than to imperil that now in force.

President Howard Edwards of Rhode Island held with Dean Ferris and stated that the question as to the possibility of division or diversion of federal funds should never be raised.

4. Federal Board of Farm Organizations

The acting chairman of the Executive Committee read a communication from the general secretary of the Board, asking that a committee be appointed to confer with it from time to time touching the agricultural welfare of the country. On motion, it was:

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Voted: That it was the sense of the meeting that the matter be referred to the Executive Committee to handle as in its judgment seemed advisable.

5. Training of Conscripted and Enlisted Men

The acting chairman of the Executive Committee outlined the salient features of the meeting of the preceding day, held at the instance of the Federal Board of Vocational Education, following which statement it was:

Voted: That it is the sense of the meeting that the Association of American Agricultural Colleges and Experiment Stations should endorse the action taken by the conference held at the Cosmos Club, January 11, 1918, touching the utilization of technical schools and colleges for conscripted men, and that it pledges the several Agricultural and Mechanical Colleges to the technical training of men for any service for which they are fitted, as outlined in the plan set forth by the Federal Board of Vocational Education.

After discussion by Presidents Edwards, Pearson and Soule, and Deans Russell and Scrugham, it was:

Voted: That the secretary be instructed to send to the president of each Land-Grant College and to each engineering dean a brief digest of the proceedings of the conference called by the Federal Board of Vocational Education for January 11, 1918, and that he suggest in his communication to each such executive that a statement be sent to the chairman of the Executive Committee by each college administration as to what the institution can do, what it will be willing to do, what it is best equipped to do in the matter of the secondary education of conscripted men along the lines developed at the conference above mentioned, it being understood that the filing of such statement shall in nowise delay the report requested by the Federal Board.

[This statement was forwarded to all college executives in the form of:

(a) A letter dated January 14.
(b) A second letter dated January 28; and
(c) The digest as of the later date.]

On motion, the Special Convention adjourned *sine die*.

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